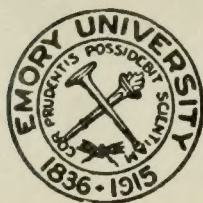




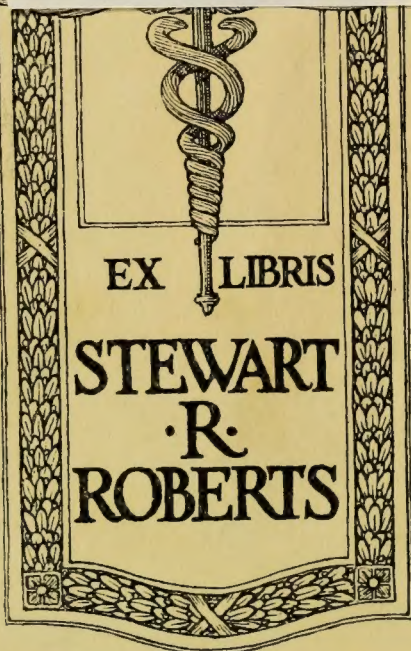
THE
ABNER WELLBORN CALHOUN
MEDICAL LIBRARY
1923



CLASS R

BOOK _____

PRESENTED BY



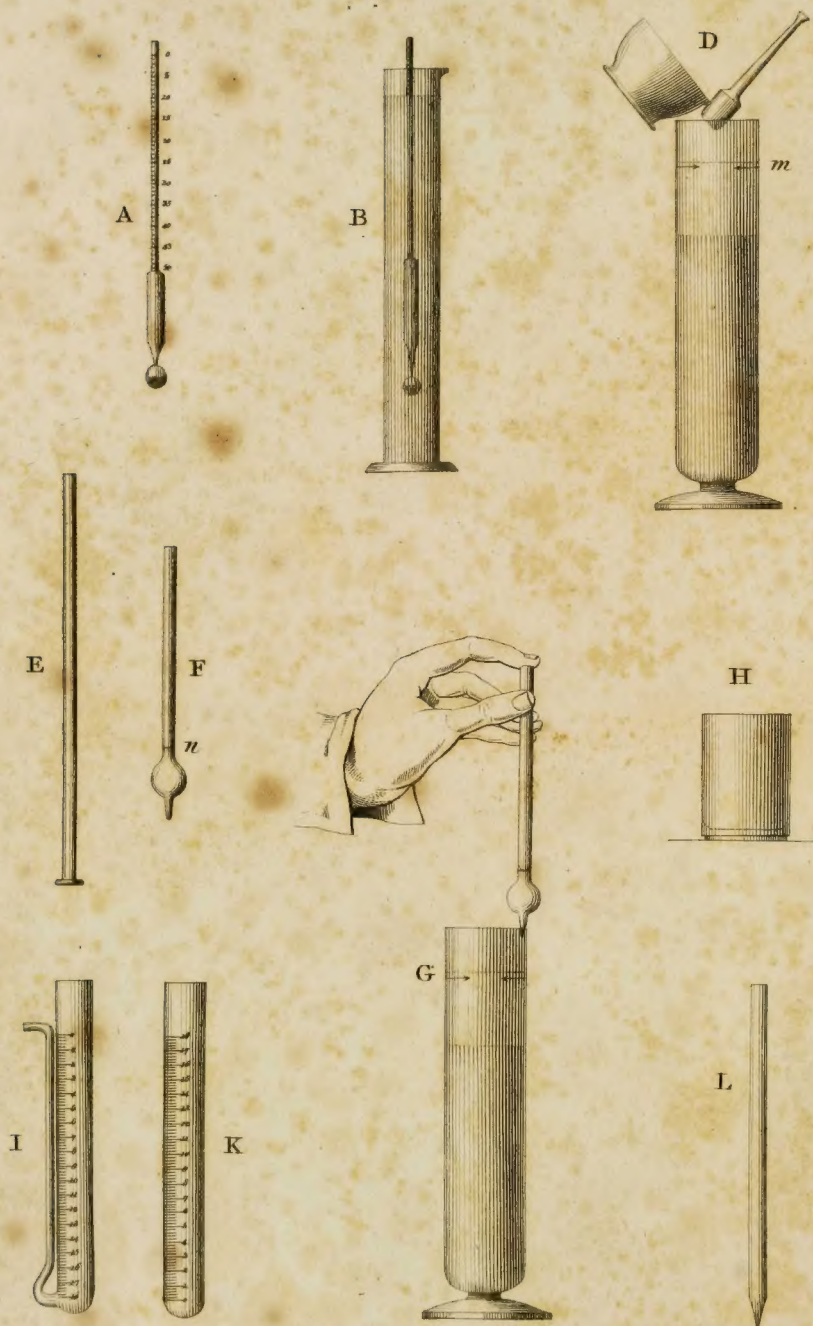
R

William Langley

50 f

0
5

CHLOROMETER, &C.



AN ESSAY
ON THE USE OF
CHLORURETS
OF
OXIDE OF SODIUM AND OF LIME,
AS POWERFUL
Disinfecting Agents,
AND OF THE
CHLORURET OF OXIDE OF SODIUM,
MORE ESPECIALLY
AS A REMEDY OF CONSIDERABLE EFFICACY,
IN THE TREATMENT OF
HOSPITAL GANGRENE; PHAGEDENIC, SYPHILITIC,
AND ILL CONDITIONED ULCERS;
MORTIFICATION;
AND VARIOUS OTHER DISEASES.

DEDICATED BY PERMISSION TO
THE RIGHT HONOURABLE ROBERT PEEL.

BY THOMAS ALCOCK,
Member of the Royal College of Surgeons in London; Member of the
Medical and Chirurgical Society, &c. &c.

"Nisi utile est quod facimus stulta est Gloria." PRÆDRIUS.

LONDON:
PUBLISHED BY BURGESS AND HILL,
55, GREAT WINDMILL STREET, HAYMARKET,
And Sold by all other Booksellers.

1827.

LONDON:

PLUMMER AND BREWIS, PRINTERS, LOVE LANE, LITTLE EASTCHEAP.

TO
THE RIGHT HONOURABLE
ROBERT PEEL,
SECRETARY OF STATE FOR THE HOME DEPARTMENT,
&c. &c. &c.

SIR,

*Convinced of the great and extensive .
usefulness of the remedies submitted to the British public
in the following pages, and persuaded that I can dedicate
them to no one with more propriety, than to him who
unites to his high character as a Statesman, the liberal
and comprehensive views of the Philanthropist, I avail
myself of the honour of your permission, and present
them to you, as an humble tribute of the Esteem due to
one whose successful labours in the cause of Humanity,
place him among the most active and enlightened Bene-
factors to Mankind.*

I have the honour to subscribe myself,

With the utmost respect,

Sir,

Your most obedient and humble Servant,

THOMAS ALCOCK.

NEW BURLINGTON STREET,
December, 1826.

CONTENTS.

	PAGE.
INTRODUCTION.....	i
ON THE USE OF THE CHLORURETS OF OXIDE OF SODIUM AND OF LIME AS DISINFECTANTS	1
On the Prevention of Putrefaction in Corpses previously to Interment.....	2
On the Disinterment and Examination of a Corpse for the purposes of Judicial Inquiry	5
On the Prevention of Putrefaction in Anatomical Pursuits.....	10
On the Prevention of Putrefaction in conducting private Anatomical Studies	16
On the Prevention of Putrefaction in conducting Pathological Investigations.....	21
On the Use of Disinfectants in Tropical Climates	25
On the Disinfection of Inhabited Wards of Hospitals, Sick- Rooms, &c.	27
On the Disinfection of Ships	29
On the Purification of Putrid Water	29
On the Disinfection of Workshops in which Animal Substances in a State of Putrefaction are employed	30
On the Disinfection and Purification of Stables	34
On the Disinfection of Reservoirs of Urine, &c.	36
On the ill effects of Mephitic Vapours in emptying Drains, &c. and on the mode of preventing them	37
Experiments lately performed in Paris, with Robert's Miner's Hood and the Chloruret of Lime, under the inspection of the Board of Health.....	45
Precautions respecting Sewers, Wells, &c.	52
On the value of Disinfecting Processes in the Prevention of Disease, and in arresting the Progress of Infectious Disorders	53
Extracts from the Report of the Board of Health at Marseilles, respecting the Lazaretto, the Plague, &c.	59
Comparison between the Chlorurets of Lime and of Oxide of Sodium as Disinfectants	62
Of the General Precautions and Management required in com- bination with the Disinfecting Processes	64

	PAGE.
ON THE USE OF THE CHLORURET OF OXIDE OF SODIUM AS A	
REMEDY IN THE TREATMENT OF DISEASE	66
General Observations on Hospital Gangrene.....	73
Hospital Gangrene ; Phagedenic, Syphilitic and other Ulcers	81
On Chronic and ill-conditioned Ulcers, more particularly those	
of the lower extremities	95
Compound Fracture	99
Diseases of the Bladder and Urinary Organs	103
Diseases of the Uterus, &c.....	106
Burns and Scalds	108
Various instances in which the Chlorurets have been found	
beneficial, viz. : Cancer—Herpes—Ulcerations with	
Caries—Putrid sore throat—Ptyalism and Ulcers of the	
Mouth—Ulcers of the throat—Small pox—Measles—	
Scarlet Fever—Ozæna—Wounds in Dissection—	
Diseased Joints.....	109
On the use of the Chlorurets in the treatment of Asphyxia and	
in certain cases of poisoning	114
On the internal use of the Chloruret of Oxide of Sodium.....	119
General observations on some of the uses of the Chloruret of	
Oxide of Sodium.....	120
ON THE USES OF THE CHLORURET IN VETERINARY SURGERY	122
ON THE PREPARATION OF THE CHLORURETS	126
Preparation of the Chloruret of Oxide of Sodium... ..	126
Preparation of the Chloruret of Oxide of Calcium	129
Mr. Tennant's Manufactory	132
Mr. Payen's remarks	134
———— formula	135
Description of Baumé's Areometer	136
CHLOROMETER OF M. GAY-LUSSAC AND MODE OF USING IT	136
Instructions for the Assay of Chloride of Lime	137
Principles on which the Assay is founded.....	ib.
Assay of the Oxide of Manganese	141
Description of the Chlorometer and method of proceeding in	
the Assay of the Chloride of Lime.....	142
Preparation of the Solution of Indigo	143
Process for Analysing the Chloride	144
Table of Weights and Measures	148

INTRODUCTION.

BEFORE entering upon the consideration of the uses of the chlorurets of oxide of sodium and of lime in medicine, the author deems it simply an act of justice to state, that it is to M. Labarraque, a distinguished philanthropist at Paris, to whom humanity and science are indebted for the introduction of these valuable additions into the healing art.

In the subsequent pages he has freely availed himself of the publications of M. Labarraque, and of various other scientific works published in France, which contain details respecting the use of these remedies.

The author begs leave to express his acknowledgements to M. Labarraque, for the liberality with which he afforded personal information on points which did not appear sufficiently developed in his published works: and also to M. Lisfranc, chief surgeon of La Pitié, whose zeal for the improvement of surgery is known and appreciated both in France and in this country, for his great politeness in pointing out many interesting cases under his treatment by these remedies, and permitting daily observation to be made of their progress, as well as for his great candour in affording every information solicited respecting them. His acknowledgments are also due to Sir Anthony Carlisle and Mr. White, surgeons, and to Dr. G. H. Roe, Physician, to the Westminster Hospital, for the obliging readiness with which

they have permitted the beneficial effects of the chlorurets to be demonstrated in cases under their care.

Although many valuable uses may be made of these agents in the arts, which may be pointed out on a future occasion, it may be observed that it is not intended in the present work to enter into the details of the employment of these disinfectants in the manufactures of animal substances; although this use of them led to their extension to the healing art, M. Labarraque having been induced, by a reward offered by the Society for the Encouragement of National Industry, to turn his attention to the means of destroying the infectious odour, and preventing putrefaction in the materials used for the manufacture of catgut and other strings made from the intestines of animals.

The nomenclature adopted by M. Labarraque has been retained; the term chloruret having been the designation used, as the English translation of the French *chlorure*, in the short notices of these remedies which have appeared in various English periodical works, and for other reasons stated below; and as the mode of preparation is detailed in a subsequent part of this work, no ambiguity need exist, whatever modification the names may undergo.

The CHLORURET OF THE OXIDE OF SODIUM may also be designated by the terms,

Chloruret of soda :

Chloride of soda :

It may be proper to observe that the mode of preparation and the peculiar properties of this article, as prepared by M. Labarraque, are not described in any English works on Chemistry with which the author is acquainted.

The CHLORURET OF LIME, formerly called the oxymuriate of lime, has also been termed the *chloride* in this country.

The dry preparation is a *sub-chloruret of hydrated lime*, the *chloruret* being formed only in the solution of the subchloruret

in water, (see page 139.) The process recommended by M. Labarraque for the manufacture of this preparation differs from that generally adopted in the arts. Various terms have been used to designate the sub-chloruret or sub-chloride of lime, as extensively used in the arts in this country; the most common appellation is that of *bleaching powder*.

Both the French and English Chemists employ the terms chlorate and chloruret (chlorure) to denote different combinations of chlorine.

The term *chloride* is used as synonymous with *chloruret*.

CHLORATES. The name of *chlorates* is given to those salts which result from the combination of *chloric acid* with salifiable bases.

CHLORURETS. Chlorine is susceptible of combining with almost all the simple substances and with some compound bodies; these are the combinations which are termed *chlorurets*: many kinds are known, but there are few which are useful in the arts. The chlorurets are classed under two principal heads under the denominations of *metallic chlorurets* and of *chlorurets of oxides*; that is to say, that the former result from the combination of chlorine with the metals themselves, and the latter from the combination of chlorine with their oxides. It is to be remarked that there are only a few oxides very difficultly reducible which are in this case; such are those of potassium, sodium, barium, calcium, &c. What especially distinguishes the chlorurets of oxides from the others, is, that they retain several of the properties of chlorine, and particularly that of destroying vegetable colouring substances; hence they are much employed for this purpose in the arts.

Although the term *chloride* is synonymous with that of *chloruret*, (*chlorure*, French) yet it is more liable to be confounded with the term *chlorate*, which, as has been already shewn, appertains to a class of salts different in their chemical composition, and not possessing either the bleaching, disinfecting, or the medicinal properties which belong to the chlorurets. (See also page 138.)

The term *chloruret of oxide of sodium* has also been retained in preference to that of *chloruret of soda*, to prevent mistake by confounding the chloruret of soda with the chloruret of *sodium*, which, like the chlorates, does not possess the same valuable properties as the *chloruret of the oxide of sodium*. The *chloruret or chloride of sodium* is the residuum of common salt, after it has been exposed to a heat approaching to redness.

In the year 1819, the Society for the Encouragement of National Industry, in France, declared as a subject for competition, (according to the desire of the Prefect of Police, charged with the salubrity of the capital) the rendering healthy the art of the catgut maker, (*L'assainissement de l'art du Boyaudier*;) this question was proposed in the following terms: "*To find a chemical or mechanical process to remove the mucous membranes of the intestines used in the manufacture of gut-strings without employing maceration, and to prevent putrefaction. To describe the manner of preparing intestines by insufflation:*" adding, that some partial trials had already led to the hope that the successive and skilful use of alkaline lixivia and acid baths might afford the solution of the problem, &c.

After many experiments M. Labarraque conceived that he had succeeded in resolving the problem: he caused the Council of Health to be informed of it, which deputed one of its members to witness the experiments of M. Labarraque in a manufactory. They were satisfactory. The Report of the Council of Health, printed in 1820, alludes to it in designating an apothecary in Paris, who, says the Report, has *succeeded in destroying all the putrescency (fetidité) in the workshops for the manufacture of catgut*.

M. Labarraque was induced to promise to compete for the prize proposed by the Society of Encouragement; he had renounced this intention when the only member of the Council who had witnessed his experiments happened to

die: M. Labarraque believed he should only fulfil a religious duty in keeping his word to one who was no more. Stimulated by this conviction he set himself to work, multiplied his experiments and remodelled the art of the catgut maker. His memoir was rewarded the 30th October, 1822, after having remained six months in the hands of the commissaries, who could not find out the disinfecting process of M. Labarraque, until after having witnessed its effects on *more than a thousand ox intestines in full putrefaction*. The details of this interesting experiment will be found in a subsequent part of this work. The prize of 1,500 francs was adjudged to M. Labarraque.

The following extract from the *Procès-verbal* of the Society at its general meeting, held the 30th October, 1822, is conclusive respecting the claim of M. Labarraque.

“ 1st. Considering that the first and principal question, that proposed by the Counsellor of State, Prefect of Police, and for which the prize was founded, is completely resolved by M. Labarraque, author of the Memoir, No. 1, the Commission proposes that you should adjudge to him the entire prize, imposing upon him, however, one condition, to which he will very willingly submit; it is that of drawing up an account of his procedure, to reduce it to the comprehension of every one, and to follow with zeal the execution of it in the different manufactories. This measure, if we would profit by the discovery of M. Labarraque, appears to us to be indispensable.”

This Commission was composed of
M M. le compte BERTHOLLET, membre de l'Académie des
Sciences;

BREANT, vérificateur des essais à la Monnaie;

DARCET, membre de l'Académie des Sciences;

DARTIGUES, membre du Conseil général des Manu-
factures;

MM. DESPRETZ, professeur de Chimie à l'Ecole polytechnique ;

MÉRIMEE, secrétaire perpétuel à l'Ecole des Beaux Arts ;

PELLETIER, professeur à l'Ecole de Pharmacie ;

ROARD, membre du Bureau consultatif des Arts et Manufactures ;

THENARD, membre de l'Académie des Sciences ;

VAUQUELIN, membre de l'Académie des Sciences ;

PAYEN, Manufacturier ;

et le professeur ROBIQUET, *Rapporteur*.

The disinfection of corpses was proposed by M. Labarraque to be effected by means of the chlorurets of oxide of sodium or of lime. The Council of Health adopted the proceeding, and the Prefect of Police gave orders to that effect. The expence for the conservation of all the dead bodies deposited at the Morgue of Paris, during one year, did not amount to *one hundred and fifty francs*, (six pounds sterling) a circumstance honorable to M. Labarraque's disinterestedness, since he was intrusted with the furnishing of the chlorurets for this purpose.

In October, 1823, the Prefect of Police issued the following order.

PREFECTURE OF POLICE.

Paris, 19th October, 1823.

“ WE, Counsellor of State, Prefect of Police, having examined the Report of the Council of Health, from which it appears that numerous experiments, made successively in various localities, and particularly at the Morgue, have demonstrated the efficacy of the use of the chloruret of lime as a mode of disinfection, according to the procedure of M. Labarraque, Apothecary at Paris, Rue Saint Martin,
Have decreed as follows :

FIRST ARTICLE.

“ There shall be established disinfecting apparatus of the invention of M. Labarraque, at the Morgue, and at the residence of each of the Commissaries of Police, herein designated,” &c. &c.

M. Labarraque made experiments upon living beings, and guided by the action of the chlorurets on dead substances, he proposed the use of them upon man in all cases of disorganization. He followed up experiments in the Hospitals, and during eight months he furnished gratuitously to the Hospitals of Paris his chlorurets, and also to all men of science in the profession who were desirous of making experiments.

In 1823, M. Labarraque proposed to the government his views for rendering healthy lazarettos, for the purification of merchandize, of baggage, of the sailors and passengers of ships, &c. He shewed the possibility of *rendering the propagation of contagious or infectious diseases impossible.*

The views of M. Labarraque were maturely examined by several learned men, who called M. Labarraque to long conferences. A favourable report was made at the end of a year, and M. de Boisbertrand, Director-general of the Establishments of Public Utility of the Kingdom, sent the sanitary views of M. Labarraque to the Lazaretto of Marseilles: see the Report inserted in the Guide Sanitaire.

The works of M. Labarraque having excited attention, the Royal Institute of France decreed to the author of *the discovery of the disinfecting properties of the chlorurets*, a prize of three thousand francs, which he received at the solemn sitting of that learned assembly, the 20th of June, 1825, amidst the acclamations of an enlightened and numerous public. M. Labarraque did not think of presenting himself to the concourse, not believing that he had yet done enough, since he continued his experiments without intermission.

ROYAL INSTITUTE OF FRANCE.

ROYAL ACADEMY OF SCIENCES.

Extract from the Programma of the Prizes, decreed in the public sitting of Monday, 20th June, 1825.

Prize founded by the Will of BARON DE MONTYON.

“ There is granted to M. Labarraque, Apothecary, in Paris, a prize of *three thousand francs* for having shewn by a great number of experiments that we may employ with success, economy, and facility, the solutions of the chlorurets of lime and of soda, dissolved in water, to destroy immediately the infectious odours arising from the animal substances employed in the art of making catgut, and those of corpses in putrefaction, also to purify places where the air is corrupted.”

The disinfection of dead bodies has been proved many times, after inhumations of several days, of several weeks, and of several months, and always with the same success. The corpse of Louis XVIII was presented to the public *without any odour*, the disinfecting chloruret of M. Labarraque having been used. M. L. was present at the embalming of the body of the late king.

The only recompence which the French Government has granted to M. Labarraque is that of the minister of the interior, who subscribed for two hundred copies of M. Labarraque's last pamphlet, which sells at one franc. The Director General of the establishments of public utility, in causing M. Labarraque's pamphlet to be transmitted to all the prefects, sent with it a circular having for its object to shew the advantages which may be derived from the use of the chlorurets. M. Labarraque has considered himself sufficiently recompensed by the kind reception which this

worthy functionary has never ceased to accord every time that he has required the attendance of M. Labarraque on objects of public utility.

The following passages are translated from the circular which M. Labarraque refers and a copy of the original is subjoined.

“The procedure of M. Labarraque presents incontestable advantages beyond the employment of gaseous chlorine, and beyond all the disinfectants which have been recommended to this day. The author of this process has made the most numerous and varied applications, and the success which he has obtained has merited honourable commendation.

“The memoir which I transmit you indicates some of the cases in which the chlorurets of lime and of oxide of sodium have been used with the greatest success to destroy insalubrious exhalations, and to remedy the accidents of which they are the cause. From hence it is easy to deduce the disinfecting properties with which these substances are endowed, and experience proves in effect that we may usefully employ the Chlorurets in question in lazarettos, in hospitals, in prisons, in depots of mendicity, in dissecting rooms, in numerous workshops, and particularly in those in which operations on animal substances are carried on; that we may employ them with advantage to disinfect places inhabited by persons labouring under small pox, and to attenuate the effects of epidemics, of contagions, of epizooties.* It is proper more especially, to make use of them when we are under the necessity of disinterring corpses by order of the judiciary authority, when diverse circumstances render it requisite to retard the interment, or accelerate the developement of putrefaction; in fine they are efficacious remedies in certain cases of asphyxia.”

* (Diseases of Cattle.)

**“ MINISTÈRE
DE L'INTÉRIEUR.**

Paris, le 17 Octobre 1825.

ADMINISTRATION

GÉNÉRALE

des

ÉTABLISSEMENTS

D'UTILITÉ PUBLIQUE

et des

SECOURS GÉNÉRAUX

2^e. BUREAU

CIRCULAIRE

N^o. 53.

MONSIEUR LE PRÉFET, j'ai l'honneur de vous transmettre exemplaires d'un ouvrage publié par M. Labarraque, pharmacien à Paris, sur les propriétés des chlorures de chaux et d'oxide de sodium, considérés comme moyens de désinfection.

Le procédé de M. Labarraque présente des avantages incontestables sur l'emploi du chlore gazeux, et sur tous les autres désinfectans qui ont été recommandés jusqu' à ce jour. L'auteur de ce procédé en a fait les applications les plus nombreux et les plus variées, et les succès qu'il a obtenus lui ont mérité d'honorables suffrages.

Le mémoire que je vous transmets indique quelques uns des cas où l'on s'est servi avec le plus grand succès des chlorures de chaux et d'oxide de sodium pour détruire des exhalaisons insalubres, et pour remédier aux accidens dont elles sont la cause. De là il est facile de déduire les propriétés désinfectantes dont ces substances sont douées, et l'expérience prouve en effet qu'on peut se servir utilement des chlorures dont il s'agit dans les lazarets, dans les hospices, dans les prisons, dans les dépôts de mendicité, dans les salles de dissection, dans les ateliers nombreux, et particulièrement dans ceux où l'on opère sur des matières animales ; qu'on peut encore les employer avec avantage pour désinfecter les lieux habités par des varioleux, et pour atténuer les effets des épidémies, des contagions des épizooties. Il convient sur-tout d'en faire usage quand on est dans la nécessité d'exhumer des cadavres par ordre de l'autorité judiciaire, quand diverses circonstances obligent de retarder les inhumations ou accélèrent le développement de la putréfaction ; c'est en fin un remède efficace dans certaines asphyxies.

D'après toutes ces considérations, je crois devoir appeler votre attention sur le procédé de M. Labarraque et sur les moyens à prendre pour en répandre la connaissance dans votre département. Je

vous invite à en recommander l'emploi dans les hôpitaux, dans les prisons, dans les autres établissemens publics ou particuliers, et dans les differens cas où il peut recevoir une utile application. A cet effet, indépendamment des instructions que vous adresserez aux fonctionnaires ou aux administrations placés sous votre autorité, vous pouvez faire publier, sous forme d'affiches un extrait du mémoire de M. Labarraque, indiquant succinctement les propriétés désinfectantes des chlorures et la manière d'employer ces substances.

Les exemplaires que je vous transmets doivent être répartis entre les divers chefs-lieux d'arrondissement et les administrations sanitaires de votre département.

Agréez, Monsieur le Préfet l'assurance de
ma considération la plus distinguée.

Pour le Ministre :

Le Directeur,

A M. le Préfet d

Signé de Boisbertrand."

The result of M. Labarraque's views respecting the Lazaretto of Marseilles will be found in a subsequent part of this work.

On the 18th of May, 1826, the Secretary of the Academic Society of Marseilles announced to M. Labarraque that the Society had awarded him a medal for the important discovery of the medical uses of the chlorurets. The letter adds that such other brilliant and flattering rewards had been conferred on Mr. L. that the Society scarcely dared to offer the tribute of their gratitude.

M. Labarraque's modesty and disinterestedness are as honourable to him as his brilliant discoveries of the useful applications of the chlorurets: the author takes the liberty of subjoining an illustration.

" Mr. Labarraque n'a sollicité aucune récompence; il a reçu des témoignages flatteuses de l'intérêt que ses travaux

inspirent aux amis de l'humanité de tous les pays ; Mr. Labarraque a la douce satisfaction d'être utile aux hommes ; son ambition est ——— satisfaite."

The useful and honourable labours of M. Labarraque have received a further confirmation by an act of Royal favour, the King of France having, on the 31st October, presented M. Labarraque with the cross and the title of Chevalier of the Legion of Honour.

The testimony of Dr. Robert, physician to the Lazaretto at Marseilles, is so honourable to Mr. Labarraque, and so creditable to the judgment and good feelings of Dr. Robert that no apology can be required for placing it before the reader. Dr. R. alluding to an historical outline of the Lazaretto of Marseilles, and of the contagious diseases which have been introduced therein since the epoch of its foundation in 1383, observes :

" It was under the empire of these various disinfecting processes that the public health and practical medicine existed during so many centuries, depending sometimes upon real success, at others on results completely null ; when a new benefactor to humanity, without other motive than regard for the public good, came, by the aid of a simple chemical combination, but much more powerful than those formerly in use, to associate himself modestly with the glory of his illustrious predecessors. By making known to the public the valuable uses of the chlorurets of oxide of sodium and of lime, respecting the preservation and restoration of health, M. Labarraque has eclipsed the fame of the celebrated Jenner, since the discovery of the latter is only most generally useful to infancy, whilst the French chemist has laboured for all ages and has especially indicated the means of preserving the crowded population of our large manufacturing towns, the most frequently exposed to so many causes of infection."*

* *Guide Sanitaire des Gouvernemens Européens*, &c. Par L. J. M. ROBERT, &c. Paris, 1826. p. 777.

The extensive usefulness of these means having been so fully ascertained in France, under the observation of men distinguished by their scientific attainments, may supersede in a great measure a detailed series of experiments.

Should however the distinguished statesman and philanthropist whose condescension has permitted these pages to appear under the sanction of his high name, be of opinion that it may be useful to humanity still further to establish the facts by a series of experiments made in this country, the author of this essay will consider himself further honoured in being permitted to conduct a series of demonstrative experiments, which may be perfectly conclusive as to the extraordinary power of these agents, under the observation of any person or persons who may be appointed to witness them.

The author of this little work has endeavoured to collect the scattered information relating to this subject, and to add such further observations as his personal observation and experience have afforded; and thereby to render these remedies available to his countrymen and others, an object which he considers of great importance to humanity.

This object he conceives may be effected by shewing the value of these agents as disinfectants and in the prevention of disease; the diseases in the treatment of which they may be beneficially employed as remedies; the precautions to be observed in their application to the living body; and lastly their mode of preparation, and the tests by which their fitness may be ascertained.

How far he may or may not have succeeded in this endeavour he leaves to the candid reader to determine: he has sought rather to prove useful than to seem learned; and whatever opinion may be formed of the merits or demerits of the work, should a single life be preserved, by the means pointed out, in those diseases which have hitherto been too often fatal, and in the treatment of which the highest skill

and greatest attention have not unfrequently failed, he will not have laboured in vain.

*New Burlington Street,
December, 1826.*

POSTSCRIPT.

Since the printing of this work was commenced, the author has had to regret that a considerable delay has occurred in the publication of these observations, owing to circumstances over which he had no controul; yet he has endeavoured to compensate for the delay by the collection and insertion of additional facts, corroborative of those of earlier date.

The author will consider himself obliged by the communication (postage free) of any facts or observations respecting the use of the chlorurets, of which, should the indulgence of the public call for a revision of this work, he will be happy to avail himself, with due acknowledgements to their respective authors.

ON THE USE OF
THE CHLORURETS OF OXIDE OF
SODIUM AND OF LIME,
AS DISINFECTANTS.

M. Labarraque in commenting upon a remarkable instance of the power of the chloruret of lime used as a disinfectant, observes:

“It was doubtless a very happy circumstance to have arrested animal decomposition, and to have annihilated, as it were, several causes of death: for who is not aware of the fatal influence of putrefied animal emanations diffused in the air which we breathe, and carrying with them the germ of mortal diseases? But there remained something still more fortunate: it was that of finding the possibility of arresting decomposition in the living body. I have had the happiness to observe this prodigy performed by the application of the chloruret of oxide of sodium to wounds.”

Such are the powers of these agents, which it is the object of this essay to elucidate.

It would be an insult to the understanding of

my professional brethren to suppose them unacquainted with the baneful influence of a contaminated atmosphere in the production of disease ; or of the imperative necessity for the correction of such a condition as essential to the restoration of patients already labouring under disease.

*On the Prevention of Putrefaction in Corpses
previously to Interment.*

One of the frequent causes of infectious or pestilential emanations may be found in the putrefaction which often takes place in corpses, previously to the period which custom has sanctioned for interment. The feelings or convenience of friends, who sometimes travel great distances to pay the last tribute of respect to a deceased relative, renders it desirable that the usual period should not be encroached upon, whilst the safety of those around requires that they should be protected from noxious effluvia. This becomes the more imperative in the humbler classes of society, whose affections, as well as those in higher stations, ought to be respected, since their limited means not unfrequently preclude the opportunity of removing the corpse to a vacant apartment.

Of the prevention of putrefaction the practice which has been adopted at the Morgue at Paris, by order of the authorities, affords sufficient proof. To this place all dead bodies found in the Seine, in

Paris or its environs, are deposited for inspection, that they may be claimed or identified previously to interment. Even when bodies have been far advanced in putrefaction, the affusion of a solution of chloruret of lime in water has immediately removed the putrid odour. The superintendant has uniformly remarked that bodies washed in this manner remain fresh much longer than others.

M. Idt, a distinguished apothecary at Lyons, wrote to *M. Labarraque* from that place, dated 4th August 1825:—"During the whole month of July the thermometer was constantly at 34 degrees,* and the corpses a few hours after death spread an odour so infectious, that during the mass which was celebrated for the repose of their souls, the priests and the friends forgot,—the former the resignation of their ministry, the latter their affliction,—to complain, and to close their nostrils. The surgeon major of the great Hôtel Dieu, *M. Gesnoul*, reasonably fearing lest emanations so mephitic should occasion an epidemic disease, proposed to the mayor to cause a glassful of your solution to be thrown upon the sheet by the commissary of police, at the moment he opened the coffin to ascertain the présence of the corpse. The mayor immediately adopted the proposition of the young doctor; and the result has been most

* By what thermometer is not stated: 34 degrees of the Centigrade are equal to 93° F., and 34° Reaumur are equal to 108½° F.

satisfactory: thus the *Journal du Commerce de Lyon*, in relating this fact, has expressed the desire to see a process so simple and useful generally adopted, &c."

To undertakers, searchers, and those persons employed to place the corpses in their coffins, to adjust the shroud, and other customary details, these disinfectants will prove a valuable safeguard against infection; and a still greater comfort to the friends, less accustomed to the disagreeable odours emanating from dead bodies, which by these means may be prevented.

The mode of employing the chloruret of lime to prevent or retard putrefaction is very simple, and may be effected at a trifling expense.

To one part of chloruret of lime add forty parts of water: mix them thoroughly, and pour off the clear liquid.

With this liquid the entire surface of the body should be freely sprinkled by means of a watering-pot, or in any other convenient manner. This sprinkling should be repeated twice or oftener, daily, according to the temperature, degree of putrefaction, &c.

Should putrefaction be far advanced, or the period the corpse is intended to be kept be considerable, it is better to surround the body with a sheet moistened in the solution, and to renew the moistening of it frequently. By these means all putrefactive odour in the apartment may be perfectly obviated.

Another important occasion on which the chlorurets may be applied, is when the body of any distinguished or illustrious personage may be required to lie in state. The remains of the late Lord Byron, though eagerly visited, were in a great measure deprived of the interest which might have been anticipated, by being soldered up in a leaden coffin: whilst those of Louis XVIII. were freely approached by his people; and this without any disagreeable odour, many persons expressing their astonishment at this circumstance. I have it from very good authority that this surprising freedom from putrescency was the result of the proper application of the chlorurets, under the direction of M. Labarraque.

On the Disinterment and Examination of a Corpse for the Purposes of Judicial Inquiry.

Another purpose for which either of the chlorurets may be beneficially employed, is that of enabling the examination of a dead body to be made to promote the ends of justice; when without such disinfecting means the degree of putrefaction might render the examination unsafe or impracticable.

M. Labarraque had foreseen the importance of this process, and had recommended the indispensable use of the chlorurets in examining the body of a person interred for some weeks; and the practicability and safety of such an undertaking

were fully verified by Professor Orfila, on a corpse which had been buried thirty-two days, and in the hottest season of the year.

The following is a translation of the authorised statement of this remarkable case.

“ Report of an examination of a dead body, made at the request of the Attorney of the King, the 1st August 1823, by Messrs. ORFILA, HENNELLE, GERDY, and LESUEUR. Drawn up by M. HENNELLE.

“ The 1st August 1823, at the request of the King’s Attorney, professor *Orfila* and Messrs. *Lesueur*, *Gerdy*, and myself, met at the cemetery of Père-Lachaise, there to make the examination of the body of the said B***, who died a month since. At half-past seven in the morning the exhumation of the corpse was proceeded with ; it exhaled an infectious odour; it remained till half-past ten o’clock upon the ground and out of its coffin, the persons who were to prove its identity not having yet arrived. The temperature was from 17 to 18 degrees of the centigrade thermometer (= about 63° or 64° Fahr.) Then the body was carried to a large and well aired place, that the examination might be made as conveniently and salubriously as possible. The odour became still more insupportable; the corpse had become swollen in a very manifest degree since it was taken out of the ground; it would therefore be important in a similar case, to make the examination as

speedily as possible. We began by making aspersions upon the subject with chloruret of lime dissolved in water: this liquor, which had been proposed by M. Labarraque, apothecary (See the 1st volume of the *Archives*), produced a marvellous effect; for scarcely had a few aspersions been made, before the infected odour was instantaneously destroyed, and it became possible to begin the operation." (Extract from the 2nd volume of the *Archives générales de Médecine*, p. 581, August 1823.)

It is not necessary to follow the very minute and full details of appearances which each part of the body presented: suffice it to say, that the presence of white oxide of arsenic within the intestines was incontestably proved, the analysis being made at the *Ecole de Médecine*, the gentlemen who had examined the body having there the assistance of Professor *Chaussier* and *M. Baruel*. The principal part of the arsenic was found in the large intestines; and it is a remarkable fact that the parts which contained the most of this white powder also contained the greatest quantity of yellow mucosites.

The name of the individual whose body was the subject of this examination (though suppressed by M. Labarraque) was *Bourcier*.*

* For the following very interesting recollections I am obliged to Dr. Filkin, Charlotte-street, Bedford-square, who at the time alluded to was residing in Paris:—

This remarkable examination, performed by men of science and high reputation, fully esta-

“Bourcier was a married man, and had lived very happily with his wife until within a short time before his death, when he was much annoyed by the very frequent visits of a Greek who was very constantly in the shop with his (B.'s) wife. This was the source of many quarrels between B. and his spouse. About the end of June 1823, Bourcier was attacked with symptoms of acute inflammation of the stomach, a disease so common at that time in Paris, that the medical attendant never thought of attributing these symptoms to poison. The disease proved fatal, and his medical attendant as well as the physician of the quarter must have certified that there was no reason to suppose that the deceased had come by his death from unfair means. On the very day of her husband's death (as was subsequently proved) and on the day of his interment, Bourcier's widow was seen at balls with her Greek lover, and very frequently immediately afterwards. This led the neighbours (who were aware of the quarrels between Bourcier and his wife as well as the cause of them) to suspect that some unfair means had been used to get rid of him. These suspicions found their way to the Police, who ordered the widow and her paramour to be arrested, and the body to be disinterred and examined. The Greek escaped. The widow was afterwards brought to trial; and though the presumptive evidence against her was very strong, yet as there was no proof that she had administered the arsenic, she was acquitted.”

Dr. Filkin adds:—“On the preceding pages [of his note] you have the circumstances which I promised concerning Bourcier. They are drawn out from memory as I stated them to you the other day in conversation; but I have since ascertained that the widow was acquitted, as mentioned at the close of my account. Previous to my obtaining this piece of information I had recollected that the paramour was a Greek, and I think also a *courier*, but am not so clear upon this point as the rest.”

blishes the great power of the chloruret as a disinfecting agent, and further shows that retributive justice may overtake the murderer at a period when, without the resources of art and science, proof would be impossible.

The instructions of M. Labarraque respecting the mode of using the chloruret of lime, recite, that repeated experiments have shown that the chloruret of lime dissolved in water has the property of disinfecting the air, and of sensibly retarding putrefaction; they comprise the following directions.

“ Before approaching a corpse in putrefaction, a tub should be procured in which may be put a load of water (24 litres, about 49 pints); pour into this a flagon (half a kilogramme=1 lb. 1 oz. $10\frac{1}{2}$ dr. avoirdupois) of the chloruret of lime, and stir the mixture.

“ Dip a sheet in the water contained in the tub, and unfold it so as to be able to withdraw it with facility, and particularly so as to be enabled to extend it very quickly over the corpse.

“ To effect this, let two persons open the sheet and place it in the liquid, holding the ends upon the edges of the tub: let this be carried to the side of the body in putrefaction, and at the same instant let the wet sheet be drawn out of the tub and laid over the body.

“ Soon afterwards the putrid odour ceases.

“ If blood or any other fluid proceeding from

the dead body have flowed upon the ground, pour upon this liquid one or two glaassfuls of the chlorured water; stir with a broom,—and the putrid odour will disappear.

“ This operation, however, ought not to be thus performed whenever the liquids spilled upon the ground may become the subject of a chemical analysis: in this case the greatest quantity possible should be carefully collected; and it is when this has been effected that the disinfection of the ground should be performed in the manner above mentioned.

“ If the infection have spread in the neighbouring places, in the corridors, stairs, &c. the infected places are to be sprinkled with one or two glasses of liquid chloruret of lime, and the fetid odour will cease.

“ Care must be taken to moisten frequently with the liquid contained in the tub, the sheet which covers the corpse: the reproduction of the putrid odour will be thus prevented.

“ As soon as the body has been removed, the sheet which has served for the disinfection should be washed in large quantities of water, dried and folded.”

On the Prevention of Putrefaction in Anatomical Pursuits.

Since anatomy is essential as the groundwork of medical knowledge, it cannot be unworthy of

attention to render the pursuit of it consistent with the safety and comfort of the student. That many lives are lost from slight accidents occurring in dissection is a fact sufficiently known and admitted ; but that ill-health is too frequently the consequence of close application in the dissecting-rooms is not so generally known, although well ascertained by those engaged in teaching. My friend Dr. Armstrong has remarked that many of the worst cases of typhus fever which fall under his care occur amongst students, and unfortunately in those whose diligence affords the greatest hopes of their future labours proving serviceable to humanity. That illness should result from breathing daily, during many successive hours, an atmosphere highly impregnated with putrid effluvia, cannot be surprising ; whilst the disgust which not unfrequently repels the younger student might be in a great measure avoided, by correcting the noisome odour which so generally pervades rooms in which dissection is carried on.

Some from habit become indifferent to the odour of the dissecting-room ; but I am not aware of any sufficient reason, why any precaution, which can render the study of anatomy more safe or less unpleasant to those whose duty it is to become acquainted with that science, should be omitted.

There is perhaps no short road to this object :

though a process capable of counteracting putrefaction in a great degree may prove very serviceable, yet that alone will not suffice. Besides the utmost attention to cleanliness, and the removal of parts no longer of use to the student, a plentiful supply of water, without the labour of carrying it, a regulated temperature, and a properly adjusted ventilation, are essential, if the health and comfort of those engaged in the pursuit be of any value.

¶ Were the public aware of the inconveniences and dangers to which a diligent student submits, before in the ordinary course of education he can acquire a sufficient foundation in anatomical knowledge, to enable him by the aid of more extended studies to become a safe practitioner in the healing art, so far from anatomical pursuits being opposed by public opinion, feelings of gratitude would supersede opposition, and be cherished towards those who could faithfully pursue at the risk of their own comfort, health and safety, a study which derives its value only from the power it confers of alleviating the sufferings of their fellow creatures.

The delight which is afforded by the investigation of the works of the Creator, can only be realized when the inimitable mechanism and structure of organized beings are sufficiently understood, to show their vast superiority over the imperfect contrivances of man : but before this

extent of knowledge can be obtained, all the disgust which generally attends the early progress of the student in anatomy must have been felt. I have known students who after much deliberation had selected the medical profession, as that in which their best exertions in the cause of humanity, might prove honourable to themselves, and useful to society, in whom this repugnance to anatomical pursuits was so strong, that it could only be overcome by a high sense of duty, and after many painful efforts, in some of which, the resolution far exceeded the physical power of resisting the appalling and humiliating spectacle of mutilated remains of human beings.

The regulation of the temperature of the air, surrounding those occupied in this sedentary employment is of sufficient importance to claim attention. In the severity of winter, during which anatomical pursuits are mostly carried on, the cold is often so intense as to render the student unable to continue his dissection for any considerable period. The mode of combining a regulated temperature and ventilation, which has been so successfully adopted in the Derbyshire General Infirmary, and more recently in the discovery ships under the command of Capt. Parry, an account of which has been published by Mr. Sylvester in his *Philosophy of Domestic Economy*, is equally adapted to dissecting-rooms as to hospitals or ships. By this method, whatever degree of temperature

shall be deemed appropriate, may be steadily maintained; and the ventilation may be so perfectly regulated, as to change the whole of the air in an apartment of ascertained dimensions in a given time. So far from these advantages being costly beyond the ordinary imperfect means in use, setting aside the first cost of apparatus and fixing, there is a much less expenditure of fuel than in open fire places. This I believe has been fully ascertained in the London Hospital, which has lately adopted these improvements in a part of its establishment.

The covering of the tables with lead, or any other substance incapable of absorbing moisture, is advantageous, whilst a simple contrivance, a conducting pipe, for conveying any liquids from the table to a bucket underneath, prevents them from flowing upon the floor. Each table or pair of tables should have a water pipe with a stopcock and a moveable spout, and a constant supply of water, to be used whenever occasion may require; whilst to prevent the floor from remaining wet, either after being washed or after water accidentally spilled, it should be so inclined, as to carry off the water. The material of which the floor is composed, should be incapable of absorbing water—stone or stucco answers this purpose. These conveniences, as to cleanliness, are carried into practice in the dissecting-rooms of La Pitié, in Paris. The most strict attention to cleanliness,

and to the removal of all useless parts, should be carried into effect. A pipe conveying warm water, would also be attended with some advantages, and drains should be so placed, as to supersede the use of buckets, to carry off water which has been used.

The floor should be washed with chlorureted water, and afterwards with plain water when necessary. With these general precautions, the prevention of putrefaction is not difficult; the aspersion of the solution of chloruret of lime or of soda over the subject each time before beginning to dissect, removing with a sponge all superfluous moisture, and renewing the sprinkling should it be required during the work, will be sufficient to counteract putrefaction, and the odour resulting from it. When the dissection is discontinued, the covering of the subject with a coarse cloth or cloths moistened in the solution of the chloruret, should not be omitted; and the moistening of the cloths should be renewed night and morning. The proportions for this purpose, may be from twenty-five to thirty or even forty parts of water to one of the chloruret.

Should any liquids proceeding from the body, be spilled upon the floor, the place should be sprinkled freely with the chlorureted water, and then be washed copiously with a broom and plain water.

Both the chloruret of lime and of the oxide of

sodium have the disadvantage of discolouring the muscles when applied to them. To those therefore who wish to preserve the rich colouring and recent appearance of the parts, at the same time avoiding putrefaction, I beg leave to point out the means which I have found to answer in a great measure these purposes in private studies.

On the Prevention of Putrefaction, in conducting private Anatomical Studies.

It may seem superfluous to dwell upon the advantages of the student or surgeon in the country being enabled to renew his anatomical knowledge of parts important in their relation to surgical practice; and further, that he should be capable of doing this, even though a separate room or building cannot be obtained for the purpose. Whoever has felt the anxious responsibility of dangerous and intricate cases of surgical disease, when he could not have the benefit of consultation with those more experienced than himself, (and this is not a rare occurrence in country practice,) will appreciate the benefit conferred, by which he may be enabled to avoid the recurrence of such anxieties.

Much assistance may be derived from careful drawings, engravings or models of the more important parts of surgical anatomy. But he who by his attainments is the most qualified to derive

assistance from these aids to the memory, will nevertheless gladly avail himself of every opportunity of fixing the recollection more firmly, by the renewed examination of the parts, on his accurate and ready knowledge of which the safety and life of his patients must often depend.

It is sometimes an object to avoid the trouble of maceration and of injecting with wax or heated liquids : for ordinary purposes both these may be avoided ; but if the beauty or value of the work be an object, then it behoves the student not to be sparing of his time and attention in the preparatory process.

For ordinary purposes a saturated solution of pure muriate of soda with a little nitre may be injected into the arteries without heat : this will considerably retard putrefaction ; but does not preserve the florid appearance of the muscles.

Should it be desired to distend the blood-vessels with injection for the purpose of tracing them, I have found the following composition to flow more fully into the minute vessels than the compound of red lead sometimes used, which, unless ground by the student himself, is seldom sufficiently fine to run minutely. Should it be desired to inject the minute vessels, a very small quantity of the fine injection, consisting of spirit varnish and vermilion or other colouring material, may be made to precede the following :

Mix a sufficient quantity of white-lead ground

in oil with vermilion to give the required colour, and thin it by adding turpentine varnish till the mixture be sufficiently fluid to be conveniently used with the syringe. This should be about the consistence of treacle, and should be gently and steadily injected into the arteries.

Should it be desired to inject the veins, rose-pink, with or without a little powder-blue, or the blue alone, may be used instead of the vermilion, and forms a sufficient contrast to admit of easy distinction. If either of these compositions be injected over-night, it will generally be sufficiently firm the next morning to admit of the dissection being proceeded with.

More care is required in the dissection, if it be designed to make a preparation, than when the wax injection is used ; for the parts cannot be so freely moved out of their relative situations without breaking the injection within the vessels. It is also apt, unless great care be used, to contain air-bubbles.

The mode by which I have preserved parts fit for dissection during weeks, and even months, sometimes in summer, has been to macerate them in warm water, taking care not to overheat the subject, and to inject into the arteries a solution of nitrate of potash, either saturated or very nearly so, at the temperature of from 120 to 130 degrees ; to let this be retained a few minutes, and then to turn the stopcock so as to allow any

part that might remain in the larger vessels to flow out ; then, the temperature being kept sufficiently high to prevent the chilling of the injection, to throw in gradually a small quantity of fine injection, previously heated by immersing the vessel containing it in hot water ; and lastly, to throw in rather briskly the wax injection of a proper temperature, so as to fill the larger vessels and to propel the fine injection into the capillaries. When cold, the dissection may be commenced. By these means the beautiful and florid appearance of the muscles is preserved or heightened : but the salt is apt to effloresce on surfaces which are long exposed : and if the cuticle be removed the skin becomes horny, the adipose substance oily, and, in short, in such a condition as to render the tracing of the cutaneous nerves impracticable. These inconveniences may be obviated by conjoining with the above the use of either the chloruret of lime or of the oxide of sodium :—for this purpose aspersions will seldom be required. If, when the dissection is not continued, the integuments, &c. be replaced, and the parts be surrounded with cloths moistened in a solution of the chloruret, the preservation may be effected for an indefinite length of time, sufficient at least to afford opportunity for a careful and complicated dissection, even when only a very few hours of each day can be devoted to the subject. Strict cleanliness must be observed ;

and if in summer, care must be taken to prevent the contact of flies, lest a breed of maggots should result from the negligence: should any mucus or slime be formed on the exposed parts, it ought to be carefully removed by wiping with a sponge moistened in a solution of the chloruret.

By these precautions Mr. J. R. Alcock,—whose models in wax representing dissected parts of surgical anatomy were rewarded by the Society of Arts by their large gold medal,—was enabled to preserve portions of subjects in his private study at a period when a succession of parts could not be obtained.

The cooler the place in which the parts are kept when not in use, the less frequently will it be necessary to renew the attentions before mentioned: but I should recommend as a precautionary measure, that the examination be made at least once a day: and if the preparation can be placed in a current of air, and the moistening of the cloths be renewed as often as necessary, any tainted odour may be entirely prevented. The cloths should not be too much loaded with the liquid, all that is superfluous being squeezed out before they are applied round the subject.

*On the Prevention of Putrefaction in conducting
Pathological Investigations.*

Little need be said of the great usefulness of pathological investigations ; since it must be obvious that the knowledge of the changes induced in animal structures by disease is essentially necessary both to the physician and to the surgeon. Who for an instant could tolerate the absurdity of an artisan attempting to remedy the defect of a machine, with the derangement of which he was unacquainted ?

Much of the difficulty of obtaining the sanction of friends to inspect the morbid appearances, when disease has proceeded to a fatal termination, may be obviated by a greater degree of attention than is generally used to avoid any unsightliness of the body after examination, and also to prevent that insupportable odour to persons unaccustomed to anatomical pursuits, which so frequently taints the apartment and furniture for many days afterwards.

I have known the carelessness of juniors, left without superintendence, harrow up the feelings of a parent by leaving portions of the body (cerebrum) of a child which had been examined, strewn upon the table on which the examination had been made,—a circumstance which cannot be contemplated without horror and regret. On

the other hand, when every proper attention has been shown to avoid the slightest indication capable of giving pain to surviving relations, and the putrid odour has been counteracted, the remark has been made that, so far from the disgusting and formidable anticipations of the friends having been realized, they have expressed their satisfaction that the examination had been permitted: adding, that had they not been informed of it they should not have been aware it had been performed, so perfectly undisturbed did every thing appear.

The moistening of the parts exposed during examination with the solution of chloruret of lime or of soda, and the subsequent sprinkling of the floor with the solution, will prevent or counteract the putrefactive odour; whilst the vessel used for receiving the water used in washing should have a portion of the solution poured into it. The towels and cloths used in the examination and in removing every trace of it, should also be immersed in a diluted solution of the chloruret.

Without these precautions, when a body far advanced in putrefaction has been examined, it has been known that the clothes worn by the operator and assistants on the occasion have been rendered useless, by the intolerable odour which they have retained; and even after every article of dress has been removed, and repeated ablutions

performed, the hands have retained the disgusting odour for many hours, in spite of every effort to get rid of it.

Both these inconveniences may be speedily remedied. If the solution of the chloruret be freely used during the examination no such putrid impregnation of the clothes can take place; and any offensive odour of the hands may be instantly corrected by washing first in a diluted solution of the chloruret and subsequently in pure water. If the putrefaction of the body be far advanced, it is desirable to moisten the hands with a solution of the chloruret on beginning the examination.

Clothes that have become tainted may be purified by hanging them up in a closet in which is placed an open vessel containing the solution of either of the chlorurets.

In embalming bodies these precautions become indispensable in hot weather, and more particularly in tropical climates. M. Labarraque mentioned to the Author an instance in which he had performed the operation of embalming, and which from the rapid decomposition of the body would have been perfectly impracticable without the aid of these disinfecting means.

In making anatomical preparations, particularly of the bones, in which it is usual to employ maceration till the soft parts become putrid and decomposed, the removing of the soft parts and

the cleaning of the bones is always a disgusting occupation, and not unfrequently attended with danger. By pouring a sufficient quantity of the solution of the chloruret into the macerating vessel a few hours before the cleaning takes place, the putrid odour is destroyed, and the bones after being washed and exposed to the air assume a degree of whiteness rarely to be obtained by ordinary means. This use of the chloruret has not, so far as I know, been pointed out in any publication with which I am acquainted. In some experiments made to ascertain the comparative value of the two modes, I found the result most satisfactory: and in the preparation of the more delicate specimens of comparative anatomy, I am fully persuaded that the use of the chloruret will be found both gratifying and serviceable to the naturalist.

In macerating preparations of soft parts in hot weather, the greatest care is required to prevent the destruction of the preparation by the putrefactive process. By adding a small quantity of the concentrated solution of the chloruret to the water used for maceration, this inconvenience may be prevented. Whilst on this subject, I beg to observe that Mr. Cocks, an ingenious and zealous member of the profession, who has cultivated drawing and the preservation of morbid specimens, has submitted to the Society of Arts an economical menstruum for the preservation of

morbid and natural parts, which promises to be useful by diminishing the expense of forming collections of wet preparations. Should it meet the approval of the Society, it will be published in their Transactions; and I should, I consider, be doing Mr. Cocks an injustice by publishing the particulars while the subject remains undetermined, although he has liberally made no secret of it when applied to by his professional brethren.

M. Labarraque has stated that anatomical preparations may be preserved in solutions of the chlorurets even in warm climates.

M. Braconnot, of Nancy, has published, in the 8th volume of the *Archives Générales*, that a solution of the red sulphate of iron (*persulfate de fer*) preserves animal substances in a very perfect degree.

On the Use of these Disinfectants in Tropical Climates.

The following document tends forcibly to exhibit the importance of the chloruret of lime as a disinfecting agent in tropical climates. It is translated from the 8th volume of the *Archives générales de Médecine*, p. 139 (1825.)

“ We have under our eyes a number of the official Gazette of the Republic of Hayti, the *Telegraphe* du 20 Fevrier 1825; and we read in it that experiments had been made at Port-au-

Prince by *M. Mirambeau*, inspector in chief of the service of Health, with the disinfecting chlorurets of *M. Labarraque*, and that they have been attended with complete success. A corpse in full putrefaction for three days, and exhaling at forty paces around it the most fetid odour, has been instantly disinfected by the solution of the chloruret of lime. Facts of this kind are sufficiently numerous in France since the important discovery of our learned countryman, and more than once we have entertained our readers with them; but they have scarcely been remarked. It is not the same at St. Domingo: under a devouring sky, where putrefaction advances with prodigious rapidity, where the miasmata acquire in a few instants a so fatal activity, and carry death into the bosoms of those who respire them,—a sure method of preventing the developement of them, and of destroying them when they already exist, ought to be, and has been in fact, hailed with a kind of enthusiasm. An eye witness, *M. Mirambeau jun.*, at this moment in Paris, relates that simple aspersions have sufficed to purify the wards of an hospital, of which the bad smell was disagreeably felt even in the neighbouring houses. Other places have been equally disinfected with the same facility, and almost always in the presence of a numerous concourse of the inhabitants. The discovery of *M. Labarraque* is therefore one of the most precious, and we do not hesitate to

place it above that of Guyton-Morveau. But that it might be more generally appreciated in France, it was necessary that it should be performed abroad."

On the Disinfection of inhabited Wards of Hospitals, Sick-rooms, &c.

To those who have had opportunities of observing the dreadful ravages of disease when patients have been confined in a contaminated atmosphere, little need be said of the importance of a simple process for correcting or destroying the noxious inhalations which endanger both the sick and their attendants.

M. Labarraque relates experiments made during two nights at the Bicêtre in eight wards, inhabited and very infected. These wards, to the great satisfaction of the patients and of the physician who attended them, (Dr. Pariset, general secretary to the Royal Academy of Medicine, &c.) have been purified by means of sprinklings made with one bottle of the concentrated chloruret diluted with thirty parts of water. The remainder of the liquor served to disinfect the tubs placed outside the wards, and the privies of the lunatic patients. We may conceive that this mode of purifying places inhabited by a great number of individuals is very simple, of little expense, and must render important services

when applied to barracks, guard-houses, military and other hospitals.

Perhaps this might be the proper place to speak of the precautions necessary to prevent patients labouring under foul or gangrenous ulcers from being surrounded by a contaminated atmosphere : but as the treatment of these diseases is considered in a subsequent part of this work, the suggestions for obviating impurity are there pointed out.

M. Labarraque gives a preference to the use of the chloruret of oxide of sodium on man ; stating that the action of the chloruret of lime would not be so efficacious, although it possesses as great a disinfecting power. For example : We shall be certain of destroying the miasmata which are developed in places inhabited by persons affected with diseases of bad character, if we are careful to sprinkle the rooms with one of the two liquid chlorurets, much diluted with pure water, or even by leaving it exposed on a plate in the sick chamber ; the chloruret must be renewed morning and evening, or when it shall have lost its peculiar odorous character.

Medical men or others, attending patients labouring under infectious diseases, will derive very great advantage from the liquid chloruret, if to the attention of respiring it on approaching these patients they join that of sprinkling it upon the floor, and principally around the beds.

On the Disinfection of Ships.

The same process as that for purifying a sick-room should be adopted: namely, that of sprinkling with the solution of chloruret the interior of the vessel twice a day or oftener. For this purpose, M. Labarraque recommends a spoonful of the chloruret to a bottle of water, increasing the strength if the fœtor be considerable. It must be observed that the perfect ventilation of the interior of a ship is as essential to the health of the crew, as that of an hospital is to the health of the patients which it contains.

On the Purification of Putrid Water.

Another highly important use of the chloruret of lime has been pointed out by M. Labarraque in the purification of putrid water. For this purpose from one to two ounces will be required for about sixty gallons of the infected water. Mr. L. adds, “ what I now advance has been verified at the commencement of the year 1824, by M. Kerauden, inspector general of the service of health of the marine, who at that time was charged by His Excellency the minister of the marine and of the colonies to make a report on my propositions, having for their object, the rendering healthy the vessels of the king, &c.; propositions which were adopted, and which I shall make known elsewhere. Dr. Marc, titular member of the Royal Academy of Medicine, (who

in 1823 was delegated by the Council of Health to assist in my experiments on animal substances, privies, &c., and was one of the first who had a glimpse of all the applications of the chlorurets) was kind enough to be present at this disinfection of the water.

“The chloruret of lime is previously dissolved in water, and added gradually, stirring the vessel of putrid water till the disinfection be complete. If the chloruret predominate, it is sufficient to expose the chlorureted water for some moments to the air, and to filtrate it or leave it to settle, in order that it may become drinkable.

“We may readily conceive of what utility this process may be, whether at sea, or in marshy countries where the water is insalubrious, or even where persons are obliged to drink the water of cisterns, which is often altered.”

*Of the Disinfection of Workshops in which
Animal Substances in a State of Putrefaction
are employed.*

The use of the chlorurets may be adopted with advantage in the business of the tanner, the glue-maker, the tallow-chandler, and various other manufactures, which at present, are perfect nuisances; but the most extensive employment, except in bleaching, has been made in the preparation of the intestines of animals, for making musical and other strings, and also dried intestines for the preservation of provisions, &c.

Although not essential to the object of this publication to enter into details on this subject, the following extract from *L' Art du Boyandier*, demonstrating the surprising powers of the chloruret of oxide of sodium as a disinfecting agent, may not prove without interest to the English reader.

The commission (Messrs. *Mérimée*, *Darcet Payen*, and *Pelletier*,) having met again in M. Labarraque's laboratory, the 16th August, 1822, various experiments on the intestines of animals were performed with complete success.

“ The disinfection having been well proved by the examination of a dozen intestines of various animals, I offered to operate on a large scale: that is to say, upon fifty or a hundred intestines of oxen. But the Commission, having desired still more extensive operations, invited me to operate in a manufactory; and it was in the establishment of *M. Millan*, at Clichy, to which we were conveyed, the 19th August, at noon. The workshop was cleaned with as much care as the old work in progress admitted of; five windows on each side of the said workshop corresponding to each other were opened, as well as the two doors: the odour was not insupportable to me, who had already contracted a sort of habit of supporting it; but the members of the commission were most disagreeably affected,—they kept themselves at the outside of this immense work-place. The workmen had quitted their usual work, and had set

themselves to brush the casks and tubs, at first with water, then with that liquid containing about one thirtieth of alkaline chloruret of potash.*

* A mode of expression used probably to conceal the real Preparation, the chloruret of oxide of sodium; the peculiar properties and manner of preparing which had not, at that time, been made known, and which Mr. L. feared might enable the "Islanders" to rival and undersell his countrymen in this manufacture.

The following quotation may serve to indicate the importance of this manufacture as a branch of national industry: "Si ce genre de fabrication était connu dans la Grande-Bretagne, nul doute que ces insulaires ne cherchassent à nous priver d'un produit qu'ils pourraient exploiter à notre détriment, en faisant de grandes expéditions en Espagne et en Portugal; ou s'en fait la plus grande consommation, et ou ils servent à conserver des comestibles animaux. Les Anglais feraient baisser les prix par des sacrifices que nos fabricans ne pourraient supporter, et une fois la destruction de nos ateliers opérée, ils seraient exclusivement possesseurs de ce genre de commerce, qu'ils sauraient ensuite rendre lucratif. Le commerce anglais connaît cette manière d'opérer, et l'industrie de son pays s'en trouve bien."—*L' Art du Boyandier*, p. 63.

In extenuation of M. Labarraque's fears, it is but justice to add that this manufacture is so considerable as to be of national importance to France, since he has shown the actual annual value of the product to amount to 66,115 francs, for the ox intestines only; whilst before the manufacture was established, a price more than double that by which the estimate had been computed had been given for the manufactured strings, and the intestines of the oxen slaughtered thrown away as useless.

It is, however, right to state, that M. Labarraque has since that time freely communicated the mode of preparing the chlorurets, which will be found in a subsequent part of this work: Had Mr. L. been disposed to keep the preparation secret, its extensive usefulness must have secured to him an ample pecuniary recompence: fortunately for humanity, he has preferred a nobler course.

The casks having been cleaned on the outside, I then poured into each of them three pounds of this same chloruret mixed with two pailfuls of water. The floor of the place was afterwards washed with a great quantity of water, containing alkaline chloruret. This effected, and the doors and windows having been shut, a *Guytonian* fumigation," (the process of Guyton-Morveau, by chlorine gas) "terminated the disinfection. All these operations required about an hour. After this time, the workshop was opened ; and the members of the Commission were able, during several hours, to devote themselves to their observations. In examining the place with the most scrupulous attention, one of the members found, at the end of the workshop, a large tub of fetid intestines. It had been forgotten, as may easily be conceived, since I had to give orders to eight or ten workmen, for a work which was not habitual to them, and to which they brought a degree of ardour so much the greater, as the Commission represented the authority which might be severe towards them, some members of the Council of Health, forming a part of it. This tub was disinfected.

"We informed ourselves of the number of intestines which the workshop contained; and M^{de}. Millan (whom in a note he mentions as directing exclusively the manufacture) answered, that it ought to contain at least, a thousand ox intestines."

Note of M. Labarraque on the Use of the Chloruret of Oxide of Sodium to disinfect and purify Stables.

The use of these disinfecting agents has been proved to be as valuable in relation to Veterinary Surgery, as in the various purposes already pointed out.

The chloruret of oxide of sodium will be of very great usefulness to render healthy and to disinfect contaminated stables, and those which shall have been occupied by sick horses.—It ought to be employed in the following manner :

Put a bottle of concentrated chloruret of oxide of sodium into a pailful of pure water, and stir the mixture.

Dip a strong brush or a broom into the chlorureted water, and immediately and forcibly brush over all the surfaces of the walls, the manger, rack, and all the parts generally, high and low, of the stable.

This being done, all the parts which have been moistened with the chloruret should be washed with pure water. In short, this process should be performed after the manner of painters, who lay a second coat upon the wainscot of an apartment.

A stable of forty feet in length by twelve in width and ten in height, requires four bottles of concentrated chloruret. Each bottle ought to be

diluted with about 24 pints of soft water. According to this, we may establish that one bottle is sufficient for a stable for three or four horses.

The disinfection of a stable being performed, the windows and doors should be opened to allow it to dry; then healthy horses may be kept in it without fear of their becoming infected. Nevertheless, in case of disease amongst horses, we ought as a prophylatic measure to make a watering, morning and evening, with a mixture of the chloruret prepared as follows:—One bottle of chloruret to four or five pailfuls of water; the stable to be freely watered with this mixture. Neither horses nor men sustain any inconvenience from this mode of disinfection, and great advantages in regard to salubrity are obtained.

For washing horses in the usual mode after they have been cured, and before allowing them to mix with those which are sound,—instead of vinegar and water, a weak solution of the chloruret may be substituted, such as used for the watering before mentioned.

These instructions are too short not to leave something to be desired under certain circumstances; but the knowledge of veterinary surgeons will supply whatever may be incomplete, and the modifications, which they may deem proper, according to the cases and the localities, will render this mode of disinfection perfectly efficacious.

*On the Disinfection of Privies, Reservoirs of
Urine, &c.*

Pour upon two ounces of chloruret of lime three or four pints of water, and mix the whole: draw off the clear liquid, and pour the solution upon and into the privies and reservoirs.

If the bad smell be not speedily destroyed, the operation must be repeated at the end of eight or ten minutes.

If the infection proceed totally or in part from urine or fæcal matters spread upon the ground, this must also be sprinkled or washed with the same solution.

Slight sprinklings should be renewed as often as necessary.

The Edinburgh Medical and Surgical Journal for Oct. 1826, after stating "as we have not hitherto taken any notice of this important discovery," gives an extract or analysis of a German work, the author of which had visited Paris, and had witnessed the use of the chlorurets.

"The next experiment was made with the public urine tubs of the *Palais-Royal*, the disgusting fumes of which render this almost an *experimentum crucis*. About a quart of the solution was mixed with the contents of one of them, and the urinous odour was completely destroyed in a single minute. Similar experi-

ments were made, with the same results, in the necessities of the *Café de Variétés*, and the *Passage de Gymnase*,—places of which we cannot give a better idea, than by mentioning that no Englishman ever went to any of them twice.”

On the ill Effects of Mephitic Vapours, in emptying Privies, Drains, &c.; and on the Mode of preventing these Effects.

In Paris the general want of sewers renders the emptying of reservoirs of excrements a frequent and abominable nuisance, which is sometimes inflicted upon the inhabitants of the most respectable hotels, without the slightest attention to the disinfecting process which M. Labarraque has pointed out,—so little is a man a prophet in his own country.

An English gentleman at one of these hotels observed, on returning home at night, some old dirty carpets hung up at the bottom of the staircase, and some ill-looking fellows lounging about. He could not proceed to his apartment without passing this barrier, and inquired what it meant. The answer was, “*pour empêcher le mauvais odeur*.” But as there was then no bad smell, the work not having commenced, he did not anticipate what was to follow. He went to bed, but was awoke by an intolerable and suffocating stench. He got up to open his window to admit

fresh air; but far from finding relief, the tubs which contained the filth occupied the street just under the window of his apartment, which was the *entresol* (or room between the parlour and the first floor), and the evil was so much increased that sleep became impossible, and he really thought he should be suffocated before morning: the thorough impregnation of clothes, furniture, and every thing in the room was the least part of the infliction; for he suffered a severe attack of bronchial inflammation, which rendered him unable to pursue his avocations for several days.

Whilst emptying the pits of nightsoil, the mephitic gas is developed in abundance, and fills the apartments of the house where the emptying takes place. We may guard against this mephitic odour by placing under the doors, on a paper spread for this purpose, a train of dry chloruret of lime, and by extending thick linen cloths, steeped in the aqueous solution of this chloruret behind the same doors: the windows and other apertures require the same precautions. In this manner the fetid smell does not penetrate into the apartments.

In acting thus upon a part of the floors of a house, and purposely omitting to use the same precautions in the intermediate floors, we shall find that these are infected, whilst those which have been defended by the chloruret, contain pure air only.

In a note read last year to the Society of Medicine in Paris, after relating a case of asphyxia in which the patient was immediately relieved by the chloruret of the oxide of sodium, M. Labarraque has added the particulars of emptying the pit or cess-pool of his house on the night of the 22nd of March, 1824.

The details (which may be found in the *Journal général de Médecine*, and in the *Archives*) are very clearly and circumstantially related. Some of the floors were defended with the chloruret, and remained perfectly untainted; whilst the floors in which these precautions had not been used were uninhabitable. He calculated from this experiment, (which also was so conducted as to protect the nightmen from injury during their dangerous and noisome work,) that the expense of completely disinfecting a pit during the emptying of it, by means of the chloruret of lime, would increase the expense about sixty per cent; an amount which he considers may prevent the general adoption of this process.

Although such may be the result in France, yet no English family of respectabilty would undergo the infliction of one night's stench, were the additional expense of preventing it tenfold.

The same effects may be produced by the chloruret of oxide of sodium.

The following interesting statement by M. Labarraque, related in his work *De l'Emploi des*

Chlorures, &c. shows the danger of such emanations and the safety which the chlorurets are capable of affording.

Mr. L. proceeds :

“ At the moment this notice is in the press a new fact has come under my observation. I deem it useful to relate it here.

“ *M. Paulin*, manager of the general administration of the drain St. Martin, came to me the 11th August, 1825, to solicit, on the part of *M. Berard*, vice-president of the Council of Health, some chloruret of lime, with the manner of using it to disinfect a portion of the drain or sewer, *Égout Amelot*, where several workmen had fallen into a state of suspended animation the preceding day. I offered my assistance in the projected operation. The nightmen were ordered for the cleansing of a portion of the sewer, from about twelve to fourteen feet, which was to be effected the next day at eight o'clock. The slime and filth to be raised were four feet and a half deep.

“ I caused to be placed, not far from the sewer, a tub containing about sixty litres (about fifteen gallons) of water, with one pound of the chloruret of lime well diffused in this liquid. A pailful of this liquor was placed by the side of the workmen occupied in demolishing the wall; and these workmen, at the moment of raising the demolitions, washed their hands and arms, and moistened their nostrils with the chlorureted

water. The nightmen took the same precaution in carrying away the soil, which, thrown some feet above their heads and mine, was watered with the solution of the chloruret, then projected by a workman upon the surface of the ground; this slime, by means of a renewed sprinkling, was further disinfected. The operation lasted more than four hours, and without any accident occurring. Whether through deference to me, or, perhaps, because I had impressed upon them my conviction of the efficacy of the disinfectant employed, these workmen were obedient to my advice. The security in which they witnessed me during the whole of their dangerous and unpleasant work,—merely holding a smelling-bottle of chloruret in my hand, and sometimes under my nostrils, may have also contributed to that effect. Nevertheless we were in a sewer infected and impracticable for more than forty years*, and in which eight workmen were seized with asphyxia a short time after having penetrated into it. This unhappy event, which occurred in 1782, was the subject of an essay by *M. Cadet de Vaux*, which gave rise to the splendid researches of the celebrated professor *Hallé*, and may more recently have contributed to those of *Messrs. Thenard, Dupuytren, Barruel, &c.*

* See the interesting work of *M. Parent-Duchatelet* entitled "*Essais sur les Cloaques ou Égouts de la Ville de Paris.*"

“ It may be seen that the *Égout Amelot*, left to itself on account of the just dread which it inspired in the workmen and the authorities, contained a considerable augmentation of filth, which augmenting daily would in the end have entirely obstructed it. Will it not be possible to effect the emptying or cleansing of it without having to deplore these fatal accidents?—such was the question which I proposed to myself whilst I was surrounded by deadly emanations,—a question which I believed myself able to answer in the affirmative; but to attain this end it would be necessary to combine the wind furnace of *Darcet*, (one of the most useful applications I am aware of,) with the abundant use of the chloruret, and with many other precautionary means relating to health which should be indicated by the localities.

As I was preparing to descend into the sewer, a woman in tears came to solicit assistance from the chief of the workmen. Her husband was one of those struck with asphyxia and who had been attacked in the severest form; he had lost all recollection during a long time, since he had been carried to No. 48 *rue des Tournelles*, without having recovered his senses. A vomit was administered: the physician, considering the frightful misery of the patient, advised him to be carried to an hospital, and believed his advice had been followed. The patient nevertheless

wished to remain at home: he had been vomiting for forty-eight hours the weak tea which had been given him, and several times within this period he had lost his recollection. I directed some remedies: acidulated water, &c.

“ The emptying of the sewer being almost finished, I desired to be conducted to the patient. The vomiting had ceased after the first cup of acidulated gum-water. This man, aged 41 years, had the appearance of decrepitude. *Pierre Aimé* lay upon a pallet; his pulse was miserable; he complained of severe pains in his head, and of great weight; he said he had great difficulty in breathing, and that he was tormented above all by the bad taste which he had constantly in his mouth, and which he said was *that of the stench (plomb) which had made him lose his recollection*: his voice was almost extinct, and he believed that he had but few moments to live. I raised the spirits of this unfortunate man, by assuring him that he should speedily be cured, and that his wages should be paid the same as if he had been at work: at the same time I made him respire the vapour of some concentrated chloruret, which he seemed to suck in with delight; his features appeared less shrunk. *Pierre Aimé* assured me that he breathed more freely, and that he had no longer the bad odour in his mouth. The next day I learned that the patient had slept five hours; he called for *the water which had relieved*

him from so great a weight and pain in his head ; I sprinkled diluted chloruret in his chamber. The 14th August Pierre Aimé was cured ; he had been able to get up and go out. I informed myself of the circumstances of his accident : “ A building stone,” said he, “ having fallen among the filth of the sewer and having stuck there, I raised it a little with my pickaxe ; and stooping, my two hands before me to lay hold of it and raise it, I fell without recollection, and as if struck with death.”

“ The effect of the chloruret will perhaps appear surprising in this instance, considering the time which had elapsed since the asphyxia (48 hours). However, persons who have respired the gas which is disengaged from animal substances in putrefaction, must have remarked that they are pursued for a long time by the fetid odour, and that even their excretions are partly impregnated with it. It therefore appears to me rational to make the patients respire the chloruret of oxide of sodium or of lime, in all cases of asphyxia arising from sewers or privies, however long after the event the patients may have been under the influence of the deleterious gas.”

Note of Experiments lately performed in Paris by Mr. John Roberts, Inventor of the Fire-escape, or Miner's-Hood, under the inspection of the Board of Health; combining the Use of the Chloruret of Lime with the advantages derivable from his invention.

Notwithstanding the advantages derived from the use of the chloruret of lime in emptying the Égout Amelot, as detailed by M. Labarraque, it appears that the sewer surrounding the Bastille had, by its noxious vapours, been rendered impracticable for many years; and that all attempts to penetrate it by ordinary means having failed, Roberts was required to enter it to show the superiority of his fire-escape hood, as a test that must at once decide the merits of his invention.

It will be recollected, that Mr. Roberts was rewarded by the Society of Arts last year for this hood*; he was afterwards repeatedly solicited to visit France, for the purpose of exhibiting the surprising security which in England it had been

* See the 43d volume of the Transactions of the Society of Arts, which contains a detail of the experiments made to determine its usefulness, the description of the instrument, and an engraving explaining its several parts. It was also noticed in various periodical publications at the time the experiments were performed in London.

demonstrated to be capable of affording. Roberts had caused a *brevet d'invention* to be taken out in France.

This humble, though highly meritorious individual has perfected several useful inventions, for which he has been twice rewarded by the Society of Arts, without having received even the common rudiments of education. The information contained in this note is therefore from his (Roberts's) own verbal communication, Dr. Filkin happening to be present, a memorandum of which was made at the time and read over to him: he confirmed the accuracy of the statement.

Besides the experiments here related, he mentioned having performed several others in presence of the authorities; from which it appears that he was enabled to remain in a suffocating atmosphere, produced by burning straw, sulphur, &c., for the space of fifteen minutes, with the assistance of his hood, the sponge of which was moistened with cream of lime; when the longest period any of those who attempted to enter the place with the mere aid of a moistened handkerchief, and alkaline and other solutions thus used, was half a minute, the first inspiration rendering them incapable of longer sustaining the suffocating vapour.

First Experiment.—When Roberts was in Paris, he was required to shew the efficacy of his apparatus, by entering the sewer of the Bastile,

which it was stated to him had not been cleaned for 37 years, and that an attempt made 15 years ago had proved fatal to two persons. The sewer was a circular tunnel about 6 feet high, and about 2 feet deep with mud, slime, and filth. He descended by a shaft, which was about 12 feet deep, by means of a ladder, having his miner's hood previously affixed round his head, and the sponge moistened with chloruret of lime dissolved in water, procured for him by M. Darcet.

He took a light with him, which burned dimly but was not extinguished;—he carried the tube of the hood round his waist, and supported the end of it by his left arm. He advanced one hundred yards from the shaft, and experienced no uneasy sensation, neither did he perceive any bad smell, although at the top of the shaft, before putting on the hood, the odour was “very unpleasant and deathly”—he was told the smell was that of sulphureted hydrogen : a paper, which he believes was moistened in a solution of lead, and which was white when he went down, was completely blackened. Some persons at the top of the shaft became affected with dizziness from the smell, his interpreter a medical man, though he did not descend, becoming so ill that he was obliged to go to bed in consequence of headache.

A young man without a hood, after Roberts had remained fifteen minutes in the sewer, came down the ladder ; he was ordered by M. Darcet

to enter within the sewer 10 or 15 feet, to ascertain how it would affect him. Roberts was going onwards when the calling out of the young man, aided by signs, (for neither could speak the language of the other,) informed him that he was about to fall. Roberts retreated back and saw him out. He was to have carried the light and to have emptied a bottle previously filled with mercury; but he was unable to proceed. Roberts took the light from him, and proceeded onwards and emptied the bottle containing the mercury, about 30 yards from the shaft, corking it again. Roberts went alone beyond the next shaft:—these shafts are distant about 90 yards from each other. Opposite the next shaft, there was less slime but more water, the depth being the same. Afterwards, when R. had returned to the bottom of the shaft, a tarpauling was let down and placed close to the shaft, within about 2 feet, on the side furthest from the river: it was nailed to the clefts between the stones, and then bags of sand were let down to make a dam to prevent the sludge from running down below that part: it was built about a yard high; but not to the top, the tarpauling completely occupying the space above.—Persons were able to place these bags at the bottom of the shaft. Roberts and the workmen then came out. A furnace was placed over this shaft, and a new communication made between the shaft and the river: and by this new communication

the emptying of the sewer from the sand bags to the river was effected !*

M. Darcet expressed his admiration that a person brought up in the mines should have had skill, perseverance and humanity sufficient to enable him to perfect so useful an invention.

This experiment took place before the Board of Health, in July, 1826.

2nd Experiment.—Roberts did not know that any thing more remained for him to show respecting this place: he was ordered to attend again: but did not think that he had to go in again. He was directed to go down another shaft, and take a line and measure the distance from one shaft to the other, those employed being unable to find the entrance to the other shafts owing to their having been covered by ruins, and none of their men would venture to go within the sewer. They told him this was a more dangerous place than the other. He was not provided with his hood which had the trunk; he therefore put on a hood weighing only three quarters of a pound, and without

* This useful application of the furnace, the Editor believes to be the invention of M. Darcet, previously mentioned in this Essay. The shaft by which Roberts and the workmen had descended, having the furnace placed over it and luted at the bottom, insured a current of air from the sewer, whilst its place must have been supplied by an equal current of pure air, drawn in at the communication before mentioned, and also at the mouth of the sewer, which remained open.

the trunk, the mouth-piece consisting of a sponge which he moistened in the same solution as that used in the former experiment. He went down, without any inconvenience, except when near the other shaft he felt a little stench, but nothing of any consequence. He carried a light: he went to the next shaft, and made a knot upon the line to measure the distance. One end of the string was passed over one of the staves of the ladder, and a workman was stationed at the foot of the shaft to communicate between Roberts and those at the top: but the man was unable to remain till Roberts returned.

Roberts made the measure—about one hundred yards, but the line having become entangled, they were not satisfied that there might not be an error. He therefore again washed and moistened the sponge in the chloruret, replaced it on his head, and remeasured the distance. He subsequently went three times, and with a long pole attempted to strike the covering or roof of the shaft, so that it might be heard on the surface; but the pole, eighteen feet long, did not enable him to reach it, the shaft here being, he thinks thirty feet deep. He returned to the surface without injury: he had stripped off all but his breeches and long boots. He was heated and perspired. After washing and dressing, he went about as usual. The test paper was still more blackened than in the former experiment; as

black as a black coat, and all the metal (brass) about the hood was much tarnished.

The following copy of an official certificate by the Baron de Plazanet, Lieutenant Colonel Commandant of the Corps of *Sapeurs Pompiers*, confirms the valuable uses that may be made of the hood, in the prevention of fatal accidents from mephitic vapours, and also in enabling firemen and others, to rescue individuals from houses on fire. Several hoods have been made by order of the Prefect of Police.

(A COPY.)

Ville de Paris. Corps des Sapeurs-Pompiers.

Après trois expériences faites devant, Messieurs les Officiers du Corps des Sapeurs-pompiers de la Ville de Paris, qui toutes ont porté à conclure que la coiffe inventée par le Sieur Roberts pouvait être d'une très grande utilité dans l'extinction des incendies, Monsieur le Commandant de ce Corps a fait un rapport à Monsieur le Prefet de Police, et ce Magistrat a ordonné qu'il fut sur le champ confectionné un certain nombre de ces coiffes ce qui a été mis à exécution.

Je me plais à certifier la vérité de ces faits et je desiré, dans l'intérêt de l'humanité que mon certificat puisse engager les personnes chargées du service des incendies ou des mines, à faire confectionner des coiffes du même genre, bien persuadé que je suis qu'elles peuvent préserver de beaucoup d'accidents graves.

fait à Paris, le 31 Août, 1826.

Le Lt. Colonel Commandant

le Corps des Sapeurs-Pompiers, de la Ville de Paris.

BARON DE PLAZANET.

It is to be remarked, that in entering sewers or other places filled with putrid effluvia, the solution of the chloruret of lime is the proper antidote with which the sponge should be moistened : in descending wells, where carbonic acid gas is accumulated, the cream of lime, (a mixture of pure lime with water to the consistence of cream,) or a solution of caustic alkali, should be used :* the same when there is any acid vapour, as from burning sulphur ; whilst for the most useful and urgent purpose, that of entering a room or building on fire, to rescue human beings, the moistening of the sponge in water only will generally suffice.

* Before descending any well, an essential precaution is to ascertain whether the air be capable of sustaining life or not. If a light be incapable of burning, the air is not fit for respiration : a large quantity of water poured down by means of a watering pot, has the double advantage of absorbing carbonic acid gas, and by disturbing the confined air in its descent, of mixing atmospheric air with that part of the gas which may remain. If a watering pot cannot be procured, the water may be poured abundantly, by pailfuls over a broom, so as to divide it as much as possible.

Recent experiments and researches, by M. Laurens, Professor of Chemistry and Pharmacy at Marseilles, tend to shew, that the chloruret of lime possesses the valuable property of neutralizing the deleterious effects of carbonic acid gas.— Further notice of his experiments, will be found in a subsequent part of this work, under the head ASPHYXIA.

Of the value of Disinfecting Processes in the Prevention of Disease and in arresting the progress of infectious disorders.

After the facts enumerated in the preceding parts of this Essay, it would be a work of superelevation, to dwell upon the advantages that may be derived from the use of the chlorurets, in destroying putrid and noxious effluvia, which, in their least injurious degree, produce disease, and when most concentrated, occasion asphyxia and death.

No one who reflects on the use of the external senses, can doubt that they are bestowed for the salutary purpose of acting as centinels, to give warning of the approach of whatever may be hurtful or dangerous, and the sense of smelling is not in this respect inferior in usefulness to the other senses.

The prevention of disease is more important than the remedial treatment, since by prevention, the pains and danger of sickness are avoided.

Next to the prevention, the value of arresting the progress of infectious disorders, must be apparent ; for in periods of great pestilence, the dread of infection has even deprived the sick, at the time of utmost need, of those cares and attentions due from fellow beings to each other as duties of humanity.

The efficacy of acid fumigations, and still more decidedly those by chlorine, has been sufficiently established; the former by the sanction of a parliamentary reward. The acid fumigations are however disagreeable in sick rooms and inhabited wards; whilst the irritating properties of chlorine in its gaseous state, upon the organs of respiration, preclude its adoption in inhabited places.

The Penitentiary at Millbank, in which the mortality was at one time so great, as to become a subject of parliamentary investigation, was some time ago submitted to fumigation by chlorine, under the direction of Mr. Farraday. The process occupied four days, all the passages and openings being carefully stopped with mats, &c. The quantity of materials used was, seven hundred pounds of common salt, seven hundred pounds of manganese, and one thousand four hundred pounds of sulphuric acid. The space fumigated was about two millions of cubic feet, and the surface of the walls, floors and platforms, about one million two hundred thousand square feet, mostly in stone and brick, and chiefly plastered with lime.

The chlorurets of lime and of soda, however possess the beneficial properties of the chlorine in destroying putrescent and infectious effluvia, without its noxious and irritating qualities; by the chlorine which enters into their composition being given off only in proportion to the presence

of aerial or other substances, for which it has a greater affinity than the bases with which it was previously combined in the form of chloruret.

Although both these chlorurets possess great powers as disinfectants, M. Labarraque has pointed out the circumstances under which the one should obtain a preference, whilst the other is liable to some disadvantages.

At the sitting of the Royal Academy of Medicine, 14th May 1825, M. Virey communicated an old table of the diseases which afflicted the army of Spain in 1812, by Dr. Estienne, from which it results that the chloruret of lime scattered between the beds of the patients affected with typhus, produced in the most infected hospitals very advantageous effects.

At the sitting of the 28th May, M. Labarraque said that the mode in which the chloruret of lime had been employed in the army of Spain in 1812, had no relation to the process by which he now employs that substance. In fact, in the army of Spain, they had no other purpose than that of disengaging chlorine in a less troublesome manner than by the process of Guyton de Morveau; whilst he employs at this time the chlorurets of lime or of soda in substance, (*solution*, Ed.) so as to apply them to the infected matters, and to immediately destroy their putrefaction. (*Archives T. VIII. p. 278.*)

The Sanitary Council of the Lazaretto of

Marseilles ordered, in December 1825, that the chlorurets should be substituted instead of fumigations in the Lazarettos, for the purification of passengers, apparel, luggage, &c. for those afflicted with plague, or suspected of other diseases, as well as for the daily purification (*assainissement*) of ships in quarantine.

Since this work was sent to the press, the author has been favoured by communications from M. Labarraque, in which he states that his expectations have been realized at the lazaretto of Marseilles. The typhus of ships, (*typhus nautique*) was brought there by a Greek vessel, in May 1826; and also by a Spanish ship in August 1826: neither the quarantine surgeon who had the care of these patients, nor the nurses who attended them were infected; they were *preserved from this disease solely by the use of the chlorurets*; whilst in 1818 this disease, brought to the lazaretto by a single coasting-pilot, who was nursed and attended in the very same place where the patients of 1826 were lodged, and under the same conditions, was communicated to the nurses and to the quarantine surgeon, and extended its ravages, notwithstanding the daily employment of Guitionian fumigations.

Although formerly, during a period of nearly ten years, when the author had the medical care of the Saint James's Infirmary, he had frequent opportunities of observing the beneficial changes

effected by the removal of patients, labouring under fever, from their confined and ill ventilated apartments to well regulated wards, where every attention could be immediately commanded; yet he has since witnessed a more speedy improvement by conjoining the use of the chlorurets with such general means as those above alluded to than under any circumstances, without the aid of these powerful agents.

How highly valuable the means of preventing infection must be, both in giving confidence to the ordinary attendants, and also to those whose duties require them to administer medical relief or religious consolation to the sick, need only be pointed out to be appreciated; for under the imperfect means in general use neither the duties of the medical attendant nor of the clergyman can be performed with safety; hence many valuable lives have fallen sacrifices:—of the devotion of those of the former class to the duties of their office, it behoves not one, himself a humble member of the medical profession, to speak:—of the devotedness of many worthy and meritorious clergymen in the performance of their sacred office of administering religious consolation to the sick, regardless of personal danger to themselves, he bears willing and ample testimony.

Dr. Robert (*Guide Sanitaire*, p. 793, 1826) has remarked:

“ The success which has been obtained in the

course of last summer to combat, to arrest, or to prevent the disease which attacked horses, a disease which may be considered as a pestilential epizootie, or gangrenous typhus, imminently contagious, leads us to presume that they (the chlorurets) may be equally efficacious in the pestilential diseases of man, and with so much greater reason, since the experiments recently made by M. Lisfranc, surgeon in chief of the hospital La Pitié, in Paris, prove that the air of wards where small-pox patients are confined, no longer communicates the disease, whilst daily sprinklings with solutions of the chlorurets are employed."

Last year, M. Labarraque communicated personally to the author, that the infection arising from measles, which had occurred in a boarding school, had been perfectly arrested, without the removal of any of the pupils, this security from infection having been effected by the free use of the chlorurets. The value of this fact may be readily appreciated by those who have known the anxiety caused to parents, and the serious loss and inconvenience to the proprietors of establishments for the instruction of youth, in which any infectious disease has occurred.

The beneficial results already obtained in arresting the ravages of infectious diseases, afford a well grounded presumption that the chlorurets may also be effectual in preventing the ravages of the plague, the yellow fever, and other pestilential

disorders; and perhaps the period is not far distant when these dreadful scourges will no longer be dreaded, and that the first benefit from the use of such powerful disinfectants, namely, that of allowing patients labouring under these pestilential conditions to be approached with as much security and confidence as when afflicted with the ordinary diseases of our own climate, which under certain unfavourable circumstances are known to be communicable from one individual to another, may subsequently lead to improved modes of treatment, which shall in a great measure divest even the plague itself of its terrors.

The Report of the Commission relating to health at Marseilles, charged by the administration to make experiments on the use of the chlorurets of oxide of sodium and of lime, in the lazaretto of Marseilles, to the superintendants of the public health, contains many valuable suggestions. This Report, which is dated the 8th December, 1825, was communicated by the Minister of the Interior to the Academy of Sciences in Paris, at its sitting of the 3d of February last.

The following are Extracts from the Experiments recommended by the Commission to be made in the Hospitals for persons labouring under the Plague.

1. Washings and aspersions with the chlorureted water to be made in the wards several times every day.

2. Tubs containing chlorurated water are to be placed in the same wards, so as to keep up a continual evaporation of the chlorurets.
3. The physicians, almoners, servants and all those who take care of the sick, before approaching them, and in quitting them, to wash their hands with chlorureted water.
4. The same persons to make use of smelling bottles filled with chlorurets, and to moisten the openings of the nostrils therewith.
5. Applications of the chlorurcted water to be made to the buboes, the carbuncles, and the gangrenes of persons labouring under the plague.
- 6 Smelling bottles or sponges imbibed with the chlorurets are to be frequently brought near to the nostrils of the same patients.
7. Water containing half a dram or one dram of the concentrated chloruret of oxide of sodium to each pint, to be given to the patients afflicted with plague as their common drink.
8. The baggage, apparel, &c. of pestiferous patients, and of those suspected to conceal some contagious principle, to be exposed to the evaporation of chlorureted water, which is to be heated to give it greater activity.
9. The apparel which is not likely to be deteriorated by the chlorurets to be washed in these solutions.

The same precautions are applicable to private houses, in which persons labouring under the plague may be confined.

The strength of the solution of the chloruret of lime for the aspersions, &c. should be one part of chloruret to thirty of water.

The use of chlorureted baths for the patients, medical attendants, &c. is suggested as a proper precautionary measure; and further to be used by the crew of any vessel in which contagion has

prevailed, or which is not furnished with proper certificates of health.

The same Commission has made the following comparison between the guitonian fumigations, and the use of the chlorurets.

“ The Commission has considered that the guitonian fumigations always do harm from the inconveniences which they occasion to those exposed to them, since gaseous chlorine is one of the substances which act upon the organs of respiration in the most disagreeable and hurtful manner, which is the cause of these fumigations being badly performed, and often wholly omitted. The Commission has thought proper to replace them by aspersions with chlorureted water, persuaded that the chlorurets possess much more efficacy than the former, since the active substance of both is the same, and every thing leads to presume, on the contrary, that its effect is more prompt in the manner in which M. Labarraque employs it, and causes no inconveniences, since the chlorurets of oxide of sodium and of lime do not exert any disagreeable or hurtful action upon the organs of respiration. Another great advantage which they possess over the guitonian fumigations is that the most polished metals, such as copper, iron, and steel, are not in any degree attacked by them. This property is proved by the report of *M. Pariset* to the superior Council of Health, whilst every one knows that the vapours of chlorine,

however disseminated they may be, attack and deteriorate all the common metals.*”

Of the use of the Chloruret of Lime as a disinfectant, compared with the Chloruret of Oxide of Sodium.

M. Labarraque observes, the honourable assent which the authority, enlightened by men of learning, has condescended to grant to his process of disinfection, has seemed to establish a preference in favour of the chloruret of lime over the chloruret of oxide of sodium. These two chlorurets are equally proper to arrest putrefaction : but nevertheless they have not the same secondary properties. He explains : in the act of the disinfection of a putrid animal substance, the chloruret passes into the state of hydro-chlorate, and the hydro-chlorate of lime having the property of absorbing humidity from the air, fixes it upon the disinfected body. Now, one of the conditions of putrefaction being humidity, it fol-

* This remark applies to metals exposed to the evaporation from the chlorurets, not to the metals in contact with solutions of the chlorurets, which tarnish silver, brass, &c. Neither does the admixture of the chlorurets with water, prevent the usual effects of moisture upon certain metallic substances.

Notwithstanding this limitation of the sense in which the sentence quoted above should be understood, the contrast between the exposure of metals to the vapour from solutions of the chlorurets, and to gaseous chlorine is sufficiently striking.

—ED.

lows that once the disinfection performed, the chloruret, after a longer or shorter time according to its quantity, has changed its state, and furnishes one of the conditions fit to reproduce the putrefactive odour. The chloruret of oxide of sodium, on the contrary, in passing into the state of hydro-chlorate, gives place to the formation of a very dry salt, which acts as a preservative by coagulating the principle which commences putrefaction. This is what he calls a secondary property. Thus the chloruret of oxide of sodium will suit whenever we wish to disinfect a body, and prevent the renewal of putrefaction; it will be fitted above all for applications to wounds of a bad character, by the property which it possesses of detaching the portion of the tissue already disorganized from that which retains its vital properties: whilst the chloruret of lime, *if it be well saturated*, for by keeping, the *disinfecting* and bleaching property of the chloruret of lime is weakened, can only serve for a simple disinfection, that is, for the exhumation of a corpse which is to be immediately examined; it is also fitted for the disinfection of the dead bodies deposited at the Morgue, because the sprinklings with chlorureted water are renewed several times daily if it be necessary.

M. Payen (Journal de Chimie Med. p. 516, 1826) has shewn that the dry chloruret of lime at 98° contains a much larger quantity of chlorine than the solution of the chloruret of soda; namely, in the proportion of 9800 to 480, or nearly 20 to 1.

Of the general precautions and management required in combination with the disinfecting processes.

From the preceding observations those who have not devoted themselves to the study of medicine might be led to suppose that the processes of disinfection before pointed out should be all that might be required to render salubrious the foul wards of hospitals and other places occupied by the sick; this would be an unfortunate conclusion, for the fact is far otherwise; although the pestilential effluvia diffused in such an atmosphere be capable of immediate correction, yet unless the cause be removed, the regeneration of similar effluvia is not prevented. Hence, therefore, the most rigid attention to cleanliness and appropriate ventilation is essential to the welfare of the sick; for although the chlorurets may destroy the putrid miasmata, they cannot furnish that supply of pure air, without which health cannot be sustained, nor disease be successfully treated. Many persons are in the habit of using fumigations of vinegar, of aromatic pastiles, and of diffusing perfumes to cover any bad smell which may pervade the sick chamber: these practices are however founded in error; for if due attention be observed with respect to cleanliness and ventilation, not only with the accumu-

tion of disagreeable effluvia be prevented ; but the apartments of the sick will be kept as sweet as any room in a well regulated dwelling house : there is no perfume equal to a perfectly pure atmosphere, and the best test of that purity is the total absence of any odour whatever.

Not only should strict cleanliness be observed, but those precautions be superadded, which may prevent even the momentary impregnation of the air surrounding the patient with putrid or tainted effluvia. If the discharges from a patient unable to quit his bed or his room, be received in a vessel containing cold water, much of the unpleasantness of the sick room will be prevented ; and in the removal of dressings, poultices, &c. from patients labouring under ulcers, particularly those of malignant character, and attended with offensive discharge, the same precautions should be observed : these are the means which common sense might dictate, when no better can be obtained ; but by the previous addition of either of the chlorurets of lime, or of oxide of sodium to the water in which these matters are received, the putrid effluvia are instantly corrected or destroyed. The immediate removal of all such substances, though often omitted, is too obviously a part of good management, to require comment.

The linen, lint, &c. which have served for the dressing of foul ulcers, retain their odour for a long time, and contribute to the insalubrity of the

places where they are deposited: by pouring a glassful of the concentrated solution in ten pints of water, and steeping these linens in this liquid, should they be required for further use, they may be immediately taken out, washed and dried, having lost their odour. These precautions are not likely to be required, unless under peculiarly necessitous circumstances, as on board of ship, where a fresh supply of linen is not to be obtained.

Of the use of the Chloruret of Oxide of Sodium, more particularly as a remedy in the treatment of Disease.

Notwithstanding the Chloruret of Oxide of Sodium, is generally to be preferred in its external application to the living body, as well as for internal use: yet it will be found in the subsequent pages, that the chloruret of lime may also be occasionally employed with advantage.

Whenever a new remedy is offered to the public, it is apt to be considered a *panacea*, a remedy for all diseases. To prevent such an impression, I shall take the liberty of pointing out what *may be effected* by the judicious use of the chloruret of oxide of sodium, and what *ought not to be expected*; or in other words, what it can, and what it cannot do.

The chloruret of oxide of sodium, in common

with that of lime, has been shewn to possess the valuable property of destroying the most putrid effluvia arising from animal substances, even when these effluvia are diffused to a considerable extent in the surrounding atmosphere ; it has also the property, when applied to the substances giving off these effluvia, of arresting or destroying the progress of putrefaction : not only does it possess this power with regard to dead and detached animal substances ; but in those distressing forms of disease, in which a part or parts of the living human body become dead and putrid, whilst yet attached to the contiguous tissues which preserve their vitality ; it has the inestimable power of speedily ameliorating this most loathsome condition, by destroying the putrid odour emanating from the dead portions ; and it moreover, generally arrests the further progress of decomposition, and promotes the more speedy separation of the dead parts from the living, than can be obtained by ordinary means : it very often is capable of changing the nature of malignant, corroding, and destructive sores, into the condition of simple ulcers : in many ulcers not malignant, it is capable of greatly hastening the cure. In short, though not an infallible remedy, it is capable, under the guidance of medical and surgical skill, sound judgment and experience, of alleviating, and often of totally removing some of the most distressing and loathsome diseases to which the human body

is liable ; diseases which too often, uncontrolled by remedies previously in use, have hurried numerous victims to untimely graves.

No individual, deeply impressed with the importance of his duties towards those who intrust their health, their lives, to his professional care, can suppose, that these beneficial results, should be expected from the hap-hazard or indiscriminate use of any remedy, however powerful : No—the healing art is not so simple, and the treatment of a dangerous and complicated disease, where even a very slight error may cost the life of the sufferer, requires not only an extended knowledge of the resources which medicine, in the most comprehensive sense of the term, can afford ; but that this knowledge shall be seconded by unremitting and vigilant care, to abstract or prevent whatever may be injurious to the patient—to bring into action, whatever may be capable of contributing towards the restoration of health.

I might here enlarge upon the ordinary, unostentatious and humble duties which the surgeon, anxious for the welfare of his patients, must cheerfully submit to perform ; duties which attract no applause, and frequently prevent those more severe inflictions, the greater operations in surgery ; operations, which strike with admiration, those who may not be competent to discuss the important question, whether it might not have been possible, nay practicable, to have averted

such a disastrous termination : but the observations contained in this work, are not addressed to the tyro to induce him to make random experiments, and thus to trifle with the health of the unfortunate individuals, who may happen to fall under his management ; but to my professional brethren, whose active humanity, ample knowledge, and experience, enable them to combine with a valuable local remedy, all the collateral aids, both physical and moral, which the healing art is capable of affording. In such hands, I feel assured, that the value of the chlorurets will not be diminished by the more extended use of them in surgical practice.*

Impressed with these views of the duties of the surgeon in the cases in which I have employed the chlorurets, I have freely availed myself of those collateral aids, which a tolerably ample experience has proved to be beneficial in the treatment of disease ; I have preferred the simple duties of humanity, to any affectation of scientific accuracy, in determining how much may be

* To those of my younger brethren, who may wish to know my opinions respecting the ordinary duties of the surgeon, I may refer to an Essay on the Education and Duties of the General Practitioner in Medicine and Surgery, published in the Transactions of the Associated Apothecaries and Surgeon-Apothecaries of England and Wales: also to a series of Lectures delivered to the Students of the late Borough Dispensary, and which have since appeared in the *Lancet*.

effected by the use of the chlorurets, under the omission of all the auxiliary means which common sense and a knowledge of the principles of surgery should point out ; although, exclusive of my private practice, the habitual allotment of a portion of my time, to those whose humble circumstances preclude remuneration, might have afforded ample scope for experiment, could I for a moment have entertained the idea, that the recovery of a humble patient, was of less importance than that of another whose circumstances might be more fortunate.

The reciprocal influence which exists between local disease and constitutional disturbance, is well known to those who have faithfully studied the medical profession ; it is this knowledge, which often leads the careful and experienced observer to adopt combined modes of treatment, with the most beneficial results, when perhaps the disease shall have existed for many years, and have resisted a series of remedies, not fulfilling all the indications which a comprehensive view of the case should readily suggest.

Hence the advantage, nay, the necessity of the full investigation of every important case ; and it is only surprising, that so obvious a preliminary should on many occasions be overlooked or disregarded. Should an artist, by way of getting rapidly through his engagements, assume that certain general proportions might suffice for every

portrait, and that a mere glance should be sufficient to give the detail, he would find himself mistaken, and the failure would be evident ; he would speedily find out, that to produce a resemblance, he must carefully study the peculiarities of form, as well as the general proportions of each individual portrait.

In the investigation and treatment of disease, it is still more necessary to consider every case as a separate study ; how otherwise, or by what magic, can the means be faithfully adapted to the end ?

Let an instance be supposed, say that of compound fracture ; and such instances unfortunately are not unfrequent, of a patient suffering dreadful torture from the spasmodic twitchings of the injured limb : the mere routine attendant, who does not think of tracing these distressing symptoms to their cause, orders opium, perhaps a castor bolus, or any other article that may be uppermost in his list of antispasmodics ; the spasms increase both in frequency and in violence, so that the limb is agitated, every spasm inflicting additional injury, notwithstanding the splints, &c. with which it may be enveloped ; locked jaw, or tetanus of the whole body supervenes, and death closes the scene !—Let the same case fall under the care of one who takes nothing for granted, without endeavouring to trace the cause of any untoward circumstance ; he finds the limb agitated

by spasm and readily traces the cause to a slight accidental displacement of the position of the limb, by which the points of bone are forced into the muscles—a sufficient cause of irritation and spasm : instead of having recourse to the *materia medica* he exercises some share of common sense, places the limb in a perfectly natural and easy position, and takes care to prevent its future displacement : he relieves the patient from pain ; all dread of recurrence is prevented by simply pointing out the truth ; the spasm ceases, and the patient enjoys a tranquil sleep, without opiate.

This example might almost supersede any remarks on what the use of the chloruret *can not* effect : neither that nor any other remedy can supply elementary knowledge, nor the habit of tracing cause and effect, without which the best applications may be so injudiciously employed as to produce evil where good only is intended.

The use of the chlorurets cannot confer manual dexterity, which in surgery is essential to carry into effect the dictates of a clear judgment : what avails it, for instance, in the treatment of an irritable and painful ulcer, that a judicious surgeon should observe, that to the use of a local remedy, ought to be joined a certain degree of external support, by bandage or other means, to a limb in which the preternatural distension of the blood-vessels, is one of the causes of the protraction

of the disease? The use of the chlorurets will neither confer that tact which shall render the application of a bandage soothing and beneficial in proportion as it is equally and properly applied ; nor can it prevent the ridges and furrows, the uneasiness and increase of pain, which often characterise the awkward and injurious use of the bandage.

The adaptation of the means to the end in the treatment of disease requires constant vigilance, and a greater regard for the welfare of the patient than for any preconceived opinions ; remedies which may be the most appropriate at one period, often prove detrimental under other circumstances ; and no remedy can be so universally applicable as to preclude the exercise of a scientific discretion, and what is of still higher value—common-sense.

General Observations on Hospital Gangrene.

The destructive progress of hospital-gangrene, although not uncommon when many wounded patients are crowded together under the unfavourable circumstances, which, in the course of war, leave to the most intelligent medical officers only a choice of difficulties, is yet sometimes met with in civil hospitals. When this disease prevails, the slightest injury or wound is apt to assume this pestilential form which rapidly

destroys the life of the part affected, taints the air with putrid and noxious odours, and more frequently terminates in the death, than in the recovery of the unfortunate sufferer, unless his timely removal from the contaminated atmosphere, which there is good reason to believe often engenders the disease, avert his fate; or, what has been less generally carried into effect previously to the valuable discovery of M. Labarraque, that the progress of putrefaction be arrested, the pestilential emanations destroyed, and the corroding and destructive progress of the disease give place to the separation of the dead parts, and thus change the patient's condition, from a state of dreadful and almost hopeless suffering to that of safety and recovery.

During the heat of summer it is no uncommon circumstance, for flies attracted by the putrid odour, to deposit their eggs, so that innumerable maggots are seen preying on the putrid mass, whilst yet attached to the living human being: a condition from which we naturally turn away with disgust and horror: neither is it so simple a matter to prevent this occurrence as may at first sight appear, nor to correct it when it has occurred; I have witnessed it not only in hospital-gangrene, but even in compound fractures, where the fears or views of the surgeon lest the limb should be disturbed, have prevented that strict attention to cleanliness, which is the best pre-

ventive; nay maggots have even been known to find their way into wounds produced by surgical operations, such as amputation and the like. That such distressing occurrences may be prevented, when ample means can command every attention, no one, who reflects, can doubt; but it sometimes happens even in hospital practice where men of great skill and acknowledged humanity preside, that the ordinary duties are left in a great measure to juniors, who, however well disposed, do not possess sufficient experience to foresee and guard against errors, which may appear slight in the first instance, but are often attended with distressing or disastrous consequences.

The following extracts from the late Mr. John Bell's *Principles of Surgery*, a work which will remain a lasting memorial of the extensive knowledge, zeal and humanity of its lamented author, convey so vivid a representation of the verminous ulcers and of hospital gangrene, that the reader may be enabled to estimate the value of a mode of treatment by which these dreadful and too often fatal diseases can be deprived of their horrors and be converted into the condition of simple ulcers.

“ When ulcers are long neglected, the worms which breed in them give a dreadful appearance to the disease. This is a shocking accident, very often seen in moist and warm countries, in the autumnal season. In hospitals where men are brought with deep, large, long neglected sores, worms breed

very fast, and most especially in those parts on which the patient lies, so as to prevent its being cleaned; 'At Stirling, in Scotland,' says Wiseman, 'all those wounded in the back and hinder parts were full of maggots, not having been dressed for some days.' Though plainly this kind of ulcer, the *ulcus verminosum*, proceeds from uncleanness, from flies being allowed to deposit their eggs in a nidus, very fit for hatching them, yet with such rapidity are the worms brought forth, and such myriads are found crawling in the basin of a great sore, that one can almost excuse the ignorance of the older physicians, who absolutely believed that the worms were generated by putrefaction merely, without any deposition of eggs."

"I never shall forget the sight I once saw in our well regulated and cleanly hospital, where there was such an exhibition of *Ulceræ Verminosa*, as perhaps never was seen by Parée at the siege of Turin. Dr. Aitken had taken an apprehension that we were too apt to trouble sores by officious dressing, and being deceived, like many others, by the wonderful reunion of fresh wounds, when laid together, and not dressed for eight days, he formed this promising conclusion, that, as according to the common saying, the "blood is the best balsam for a wound," "its own foul matter should be the best balsam for a sore." He resolved not to dress the sores of the surgical wards at shorter periods than five or six days, but that the matter might not run through the bed during that period, he made the nurses gather all their old sponges, and applied to each sore a sponge. Four or five days after, a great many gentlemen attended in the wards, on the tiptoe of expectation for the further issue of this experiment! each sore, as it was successively opened, was in a horrible condition, "the worms they crept in, and the worms they crept out," and the doctor was in great disgrace till he discovered the cause. He had given the nurses very strict injunctions about cleansing their sponges, which they very strictly obeyed; but each sponge, after being washed, was laid by the window to dry; it was hatching season with the great flies, who were very glad of the sponges to deposit their eggs in; and when these eggs were laid into the sores, and kept there for some days with all the

advantages of such a situation, they did hatch with a vengeance. Dr. Aitken's vindication of himself, may be seen in his "Principles of Surgery."

"Excepting such ulcers as these which I have described, none, I believe, are entirely local; every great ulcerated wound becomes so from a fault in the constitution, not from the ill disposition of the part. This at least is the case in every dangerous ulcer; and this observation very naturally occurs to me, when I proceed next to speak of the *Hospital Sore*, which I would not regard as a mere ulcer, to be treated like other common ulcers, but as a general affection of the system, a mortal disease, for when it rages in a great hospital it is like a plague; few who are seized with it can escape.

"There is no hospital, however small, airy, or well regulated, where this epidemic ulcer is not to be found at times; and then no operation dare be performed: every cure stands still, every wound becomes a sore, and every sore is apt to run into gangrene: but in great hospitals especially, it prevails at all times, and is a real gangrene; it has been named the hospital gangrene, and such were its ravages in the Hôtel Dieu of Paris (that great storehouse of corruption and disease), that the surgeons did not dare to call it by its true name, they called it the rottenness, foulness, sloughing of the sore! the word, hospital gangrene, they durst not pronounce! for it sounded like a death-bell; at the hearing of that ominous word, the patients gave themselves up for lost. In the Hôtel Dieu this gangrene raged without intermission for two hundred years, till, of late, under the new government of France, the hospital has been reformed."

"If the patient is to die, the gangrene or wasting of the cellular sheaths proceeds; the skin first sloughs off, then the fascia is destroyed; those lamellæ of the facia, which dive betwixt the muscles to enclose, protect, and nourish them, are next affected; the matter continues slimy and thick, and in prodigious quantities; the muscles are divided from each other more and more. In many who suffered under the dis-

case at the same time with Joiner (the boy above mentioned), you could have laid your hand edgeways betwixt the several muscles of the thigh. Then the vomiting, diarrhoea, and nervous symptoms increase, the pain is dreadful; the cries of the sufferers are the same in the night as in the day-time: the ulcers continue to eat down and disjoin the muscles, the great vessels are at last exposed and eroded, and they bleed to death. Thus, a lad of the name of Handling who had at the first but a slight wound in the thigh, had the cellular membrane, in the course of a few days, so destroyed, that you could put your clenched fist into the hip, and could lay the hand sideways betwixt any two muscles of the thigh. You could have counted each muscle, as in a dissection, from the tuber ischii to the ham. The branches of the Profunda Femoris first gave way, then the sciatic vessels; for three nights, he lost two or three pounds of blood each night: it would have been almost cruel to have stopped the hæmorrhage, had it been possible, so very desperate was his situation; on the fourth day he died. I hope and believe, that these scenes have made a lasting impression on the few who have witnessed them.

“These are the forms which this disease assumes, when it attacks an amputated stump, a broad and open wound, a laceration of the skin, or any surface which is apt to become a flat sore. But when it attacks a narrow wound, as a bullet wound, a wound with any pointed instrument, even the prick of a nail in the finger, it assumes at once the form of an Erysipelatous Gangrene (*Erysipelas Gangrenosa*;) and when this disease prevails in the hospital, you may see even a nurse, from some slight hurt in the hand, which at another time could have done no harm, have one day a swelling of the wound, on the next an erysipelas of the arm, with dreadful pain and low fever; on the third day, the arm will become livid, and covered with vesicles, and in two days more, fall into gangrene; the woman oppressed in the meanwhile with hiccup, low delirium, and other symptoms of approaching death.”

Although hospital gangrene is apt to spread to an alarming extent, and is too well

known to be highly contagious when patients are crowded together, and though it might from its name be supposed to be confined to hospitals or places where numbers are brought together, yet whether from peculiar states of health or from local circumstances, the same condition of wounds or ulcers may supervene in private life, and when it cannot be traced to any direct infection or contagion; although in some occupations, such as those of the tanner, the butcher, &c. it may sometimes be directly traced to the contact of putrid animal substances with the wounded surface.

A case of hospital gangrene, resulting from an abscess in the axilla, occurred at no very distant period, and came under the care of a surgeon, whose ample knowledge and rank in his profession enable him to state with equal candour what is not known, as well as what is fully ascertained. He observed that although numerous instances had fallen under the treatment of his colleagues and himself, and although great care had been employed, and very various modes of treatment adopted, still the result had been so generally unfortunate, that he was free to confess he knew of no remedy which was certainly capable of arresting this dreadful disease: a junior colleague had confidence in arsenic; the senior, having known the poisonous effects of that mineral, induced by its application to wounds, stated his reluctance to have it employed, unless as a last

resource; but added, that as he himself was unacquainted with any remedy on which dependance could be placed, if his colleague was confident of the benefit to be derived from the application of the arsenic, he might take the charge of the patient and get him well. The arsenical solution was freely used, but without any beneficial result, although personally applied by the gentlemen to whose care the patient had been transferred; the sloughing extended from day to day, the odour being most intolerable, till death terminated the unfortunate patient's sufferings.

The multiplication of the names of diseases, and the consideration of the diseases when thus named, as so many abstract beings or essences have been far from advancing the practical resources of the healing art: many conditions which are described as separate diseases are little more than the same diseased or morbid process in various degrees of intensity or in successive stages; and very often under the influence of physical agents, which act favourably or unfavourably upon the living body; whilst the progress of disease not unfrequently is as decidedly influenced by mental impressions, by hope, by fear, or despondency, as by the physical agents the presence of which may be more easily demonstrated.

Hence, the more extensive the knowledge possessed by the physician or surgeon of the phenomena of health and disease, and of the

various circumstances which constitute the *juvantia* and *lædentia* of the healing art, the more comprehensive will be his view of any given instance of dangerous disease, and consequently the more directly will the means, which this clear-sightedness enables him to select, be adapted to the end they may be designed to accomplish. Diseases are not so simple as to be susceptible of being removed by any single remedy, however powerful it may be, when judiciously adapted to the circumstances of any individual case; neither can any absolute rules supersede the judgment which should determine not only the appropriate remedies, but the combinations, modifications, and details of the remedies when selected, which shall render them perfectly adapted to the existing circumstances of any given instance of disease.

The terms phagedenic ulcer, gangrene, sphacelus, mortification, &c. may all in succession happen to apply to a single individual case; and the prevention or speedy correction of the condition indicated is of more importance to humanity than the discussion of the term or terms by which such condition may be designated.

Hospital Gangrene, Phagedenic, Syphilitic, and other Ulcers.

The following numerous instances of the beneficial applications of the chlorurets in the

treatment of disease, have been collected partly from the works of M. Labarraque, and partly from the various scientific journals and other works relating to Medicine and Surgery in which they have appeared. The author has added observations on cases which have been under his own care, or have fallen under his immediate observation in the practice of his friends.

M. Jules Cloquet, adjoint surgeon in chief of the Hospital Saint Louis, has used the chloruret of oxide of sodium successfully to gangrenous ulcers; in several of these extremely severe diseases this able surgeon has caused the mortified limb to be bathed in the chloruret diluted with ten or fifteen parts of water, and has given inwardly from twenty-five to thirty drops of the chloruret of oxide of sodium in a pint of ptisan. His observations will be published.

Professor *Marjolin*, surgeon in chief of the Hospital Beaujon, has used the same chloruret to gangrenous affections, whether this state occurred after the amputation of a limb or from any other cause; he observed that the eschar became quickly detached, and that the disease was limited in the greatest number of instances.

Dr. Ségalas, associated professor at the Faculty of Medicine, at the end of physiological experiments, said more than two years ago, "that the physician ought to be very reserved in the application of this substance (the chloruret) to denuded

tissues, and especially in its injection into the genitals. Diluted with water it is less irritating, and does not on that account preserve less of the precious qualities which have placed it among our energetic remedies.* Now,† says he, I support this latter proposition by two cases of cure of gangrenous diseases, very recently performed under the influence of this agent, commonly called the *liquor of Labarraque*."

The one of these facts has been observed upon a man affected with a gangrene, the consequence of an infiltration of urine, (*the description of the disease follows*) and moreover the patient's scrotum was quintuple in size, infiltrated with urine and sphacelated at its lowest part, in an elliptical extent of four inches in the direction of the raphé, and of from two inches to two and a half in the opposite direction. I incised the exchar deeply, I left the lips of the wound to disgorge, and I passed a fine catheter into the urethra; I then applied lotions to the dead parts with the chloruret of soda in its pure state;‡ the place, the bed, and the chamber were instantly disinfected. I finished by dressing with lint impregnated, with the same liquid diluted with four times the proportion of water. The next morning, to my

* *Journal de Physiologie experimentate*, July, 1823.

† *Journal de Chimie Médicale*, 1825, p. 272.

‡ Chlorure d'oxide de sodium.

great satisfaction, I found several of the eschars detached and the patient in a very favourable state. I repeated the dressing of yesterday; in the evening the wound was vivid on its whole surface. I ceased to use the chloruret, ten days afterwards the wound was entirely cicatrized. The second observation is relative to a horse treated by *M. Bouley*, jun. veterinary surgeon, and which will be spoken of subsequently.

An unfortunate case of gangrene from infiltration of urine, occurred lately at the Westminster Hospital. The patient was an old man, who had for several years had stricture in the urethra, but without urgent symptoms, having continued his work till within a day or two of his coming to the Hospital. He was admitted on a Friday, labouring under complete obstruction of urine. Attempts to pass the catheter did not prove successful. During the night the urethra gave way and the scrotum became enormously distended with urine. On the Saturday the parts containing the extravasated urine were in a state of mortification, of a dirty brown and greenish hue. The scrotum was freely divided, and a considerable quantity of urine oozed out. The odour was horribly offensive. The unfortunate patient sunk and expired on the Sunday. The chloruret was not used.

A case of a gangrenous affection of the cheek, cured by the chloruret of oxide of sodium of

M. Labarraque, was communicated to the Royal Academy of Medicine, at its sitting of the 10th April, 1823, and inserted in the *Revue Medicale*, by Dr. REY. This case is also mentioned in the first volume of the *Archives*, p. 617.

Observations relative to venereal ulcers complicated with hospital gangrene, cured by means of the chloruret of oxide of sodium by M. GROSSE, M. D. principal surgeon of the army, and surgeon in chief of the Hospital of Picpus, at Paris. This memoir was read to the section of Surgery of the Royal Academy of Medicine, at the sitting of July 24, 1823, and inserted in the 14th volume of *Recueil de Memoires de Médecine de chirurgie et de pharmacie militaires*, published by order of his Excellency, the Minister of War. As this work is not published for sale, I consider it useful to make known the first of these observations.

“ P*** corporal of the 16th regiment of the line, entered the military Hospital of Picpus, the 29th January 1822, for a chancre on the prepuce and a bubo in the right groin. He was treated by frictions: the bubo suppurated at the end of some days, and was opened by the bistoury, The chancre healed very well, but the wound from the bubo, which was a little extended, remained stationary during more than five months, notwithstanding the most appropriate local and general treatment.

“ At the end of this time, the gastric and pulmonary organs were the seat of a great irritation; the wound from the bubo changed into a corroding ulcer, which inflamed and became painful: the suppuration from it was fetid and extremely

abundant, the hospital gangrene supervened, and in a few days the ulcer invaded a great part of the skin of the abdomen. The patient was separated from the others.

“ The inflammation of the alimentary canal nevertheless did not resist a proper treatment, but the hospital gangrene continued its ravages. All the means employed in similar cases were put in requisition, the ulcer again put on a favourable aspect.

“ The mercurial treatment, which had been suppressed, was resumed, and all went on well enough for some time.

“ A short time afterwards the same accidents re-appeared with much greater intensity, and nearly carried the patient to his grave. The same means employed again produced a second time a momentary relief; but some time afterwards there occurred a new return of the accidents, which were again calmed; P***, in a word, remained during nearly a year between life and death.

“ The patient continued in the following state the 16th May, 1823, the date of the first application of the chloruret of soda: extreme wasting and weakness; inflammation of the gastric and pulmonary organs, gums spongy and fungous, skin dry and parched, continual constipation and want of sleep; the ulcer extends from the anterior superior spine of one ilium to that of the other, passing over the abdomen, two inches and a half below the umbilicus; it descends on each side between the scrotum and the thigh; its aspect is horrible, it occasions dreadful pains: the edges are swollen, jagged, turned back here and there, and all the skin which forms them is loosened. The suppuration, very abundant and very fetid, is mixed with the blood which the corroded vessels allow to escape.

“ This patient is dressed three times a day with dossils moistened in the chloruret of soda, in the proportion of two ounces to four of water. On the next day the odour of the chloruret had replaced that of the hospital gangrene: the proportion of the medicament was increased one ounce, and the same mode of dressing was continued; the day following, there was no longer any fetid odour, scarcely any suppuration; the surface of the ulcer was very favourable, the edges were flattened; the cicatrix proceeded from the circumference to

the centre, and showed itself at the same time on various points of the extent of the ulcer: the other inflammatory symptoms had disappeared.

“ On the fifth day the chloruret was applied pure ; the cicatrix advanced rapidly : the ninth day the inflammation was too intense, the use of the chloruret was suspended, and the ulcer dressed dry : the fungous flesh was cauterized with the solution of nitrate of silver. The chloruret was resumed towards the fourteenth day, and on the eighteenth there remained only some small ulcerated spots. P——had recovered his appetite, he walked with crutches : gradually his strength returned, and he is now radically cured.

In the second volume of the *Archives* it is mentioned that M. Gorse (Grosse?) presented for the examination of the members, a soldier whom he had cured of a foul venereal ulcer, extending transversely from one groin to the other, by the application of the liquor of M. Delabarraque (Labarraque). The confusion of proper names in French medical literature, has sometimes afforded amusement to the English reader, more frequently it is a source of perplexity, not easily obviated.

Respecting venereal ulcers, a memoir was read at the Royal Academy of Medicine, in a notice on the use of the liquid known under the name of *reactive* of M. LABARRAQUE, in the local treatment of certain ulcers, by M. CULLERIER, Surgeon to the Venereal Hospital, Member of the Royal Academy of Medicine, &c. and published in the *Archives générales de Médecine*, T. I. p. 448, 478 ; and the *Annales de la Médecine Physiologique*, April 1823.

M. CULLERIER the nephew, Surgeon of the Venereal Hospital states ; that he had only at that time been able to employ the *eau de javelle* (one of the terms used to designate the chloruret of oxide of sodium, before the mode of its preparation was made known) in fetid, sanious, chronic ulcers which distinctly presented incipient hospital gangrene. My trials, he observes, have been performed in five cases of reputed syphilitic ulcers, between the toes and at the base of the nails (rhagades onglades) ; in two cases of corroding fetid ulcers, the one at the vulva, the other at the groin, the consequence of a bubo in a man. With all these patients the disease had resisted both general and local remedies during several months.

The action of the remedy was very prompt : these surfaces which exhaled at each dressing an insupportable stench, which left on the lint a layer of ichorous pus, lost their fetid odour at the first and second applications. With one of the patients who had deep ulcers between the first and second toes, and between this and the third, the odour has not been so quickly destroyed ; this was occasioned by the remedy not penetrating to the bottom of these ulcers, for as soon as it arrived there by means of immersion of the part and by injections, the disinfection took place.* The

* Mr. Frederick Price, Aldersgate-street, has used the chloruret successfully in similar cases.

odour of chlorine replaced the putridity kept up by a sort of local fermentation. The chloruret of soda destroys it, and puts the ulcers into a favourable condition for cicatrization; this is also effected in a short time. Two of these patients were cured in five or six days, so that we may really consider the reactive in these cases as a mean both of disinfection and of cure.

At the sitting of 30th June, 1825, of the Royal Academy of Medicine, M. Lisfranc informed the section of Surgery, that for some time past he had used with success the chloruret of lime in the treatment of atonic ulcers.

M. Girard added, that he had also employed this remedy with advantage in the treatment of the carbunculous affections which had been complicated with the epizootic disease which had prevailed amongst horses.

Royal Academy of Medicine, 11th August, 1825.

M. Lisfranc informed the Section (of Surgery) that in burns of the second degree, and after having used emollient cataplasms for two or three days, he has successfully employed the chloruret of lime; the solution marked three degrees of the chlorometer of Gay Lussac, he thinks that this remedy would be equally useful in hospital gangrene. This proposal furnished to Messrs. Maingault and J. Cloquet, the opportunity of announcing that they had just observed two cases of that disease in private practice, which is very rare;

the two patients were in very opposite conditions ; the one rich, living in a very healthy quarter, the other poor, and placed in a very different situation. M. Ségalas also related that very recently in a case of chronic catarrh of the bladder, undoubtedly complicated with ulceration of that organ, he had succeeded in weakening and even arresting for a time the infectious odour of the urine, by injecting into the bladder a fluid to which a certain quantity of the chloruret of lime was added.

(*Archives T. 9, p. 138.*)

Royal Academy of Medicine, 27th August, 1825.

Monsieur Lemaire communicated some cases which prove that a solution of chloruret of lime in the proportion of one part of the salt to three of water, has been very useful in cases of ulcers : they have become cicatrized in eight or ten days. M. Laubert asserts that in military hospitals, this good effect of the chloruret of lime has been already ascertained. M. Vauquelin relates that Dr. Chamseru has long employed the oxygenated muriatic acid, diluted with water, and taken as a drink in syphilitic diseases, but that the irritation of the stomach had rendered it necessary to abandon it ; the urine and stools were pale and quite colourless. *Archives Généralés de Médecine, T. 9, p. 140.*

The chloruret of oxide of sodium, was used with very good effects in the ulceration resulting from gangrene of the cheek, in a boy aged about

nine years, a patient of Mr. Ollier, Surgeon to the Western Dispensary. The boy had laboured under fever, and the destruction of the cheek had taken place, before he came under Mr. Ollier's care. The dead parts had separated, leaving a great part of the lower jaw perfectly denuded; there was a copious and offensive discharge, which evidently, by the fetid odour of the breath, must have tainted the air respired by the patient. A solution of the chloruret, in the proportion of one part to six of water, was applied to the ulcerated surfaces, and the dressings moistened with the same solution from time to time: the putrid odour immediately disappeared; the necessary attention was paid to the general health, which was extremely disordered, the patient laboured under excessive diarrhæa, (a circumstance far from unusual, when the system is under the influence of putrid emanations,) and was in a state of extreme danger. The condition of the ulcerated surfaces rapidly improved, the diarrhæa ceased, and the strength of the sufferer gradually increased: the solution of the chloruret, there being no longer any putrid odour and the surfaces granulating kindly, was changed for the black wash, and when I last saw the patient, he was in a fair way of recovery.

In a case of mortification of the foot and part of the leg of a patient, aged fifty, the mortification having succeeded fever, and the exhausted condi-

tion of the sufferer precluding all hope of recovery, the putrid odour was entirely corrected by the ablution of the dead parts, with a diluted solution of the chloruret of oxide of sodium, and the application of lint moistened in the concentrated solution, twice a day.

M. Lisfranc*, Surgeon in Chief of La Pitié, has had the good fortune to preserve the limbs of several patients, which were about to be amputated, by applications of the chloruret of oxide of sodium, and he has been enabled to say with truth to his pupils ; *henceforward, there will be no longer any gangrene (pourriture) in Hospitals, thanks to M. Labarraque.*†

In cases of phagedenic ulcerations of the genitals, the author has used the chloruret of oxide of sodium, with decided advantage. In the treatment of these cases, the general principles of surgery were kept in view, and care was taken to avoid those circumstances, which, on a careful review of each case, appeared to have exerted an unfavourable influence. He may here be permitted to observe, that such distressing cases seldom take place, unless under peculiar circumstances of the patient's health, or through errors, more frequently depending upon the patient than the medical man : for not unfrequently, the mischief is done before the patient seeks surgical assistance.

* Guide Sanitaire, page 799. † A bold assertion.—ED.

In one instance, the patient had laboured under a corroding ulcer, which had destroyed a considerable portion of the dorsum penis, and had penetrated under the corona glandis; there was frequent hemorrhage from the deeper parts of the ulcer; there were other ulcers in the groin. The patient had been ill four months, and had been confined to bed for several weeks; he was desponding, owing to the frequent returns of hemorrhage, and the continued progress of the ulceration; the discharge was thin, copious, and extremely offensive. The surrounding parts were hard, of a deep red, and greatly swollen. Indeed, the appearance was sufficient to give cause of alarm. He suffered much pain. The chloruret of oxide of sodium was applied to the ulcerated surface, the poultices and other applications which he had been using, were left off: his mind was relieved by the assurance, that notwithstanding the frightful appearance of the part, he would soon do well; his diet was put under strict regulation, and such attentions afforded, as his general health, which had suffered greatly, required.

The relief from pain, after the dressing with the chloruret, enabled him to obtain a good night's rest, the first, he declared, which he had had for several weeks: the offensive odour of the discharge was corrected; the ulcer became cleaner, and granulations appeared; the hemorrhage did not return, and in a few days the corroding ulcer

was reduced to the condition of a common healthy sore. The swelling, hardness, and redness of the surrounding parts, speedily abated. He was obliged to resume his avocations, before the sore was healed : he was under the necessity of taking much exercise, and of managing the dressing of the part as well as he could, with merely occasional professional assistance. Under these disadvantages, though the sore was divested of all danger, its progress was variable, and a considerable time elapsed, before it was completely healed.

In another case the patient had been ill only a fortnight ; but so rapidly had the ulceration proceeded that a large portion of the upper and back part of the prepuce had been destroyed, and the glans protruded through the aperture, the remaining part of the prepuce hanging down under the glans : the glans was ulcerated over nearly its whole surface. The solution of chloruret of oxide of sodium was applied to the ulcerated parts, and rest, and regular diet, with other antiphlogistic means, strictly enjoined. In two days the extension of the ulceration was checked and the parts began to granulate, and to assume the appearance of a common sore. In a few days the pendulous portion of the prepuce was removed and the parts healed under common treatment.

I might contrast the favourable progress of

these cases with an instance of recent occurrence in which a phagedenic ulcer nearly surrounding the penis was allowed to proceed, under the use of mercury, poultices, opium, &c. till the urethra ulcerated, and the urine was discharged by the fistulous opening thus produced. Although, as before intimated, the chlorurets cannot furnish medical or surgical knowledge, their use in such cases is capable of producing great benefit, if the general treatment be free from error.

On Chronic and ill-conditioned Ulcers, more particularly those of the lower extremities.

The frequency of ulcers of the legs, and the tediousness of their progress render it highly desirable that a remedy capable of contributing to the comfort of patients afflicted with ulcers, and of expediting the healing process should be generally known to the profession.

Ulcers of the leg are often combined with varicose veins, and under such circumstances not unfrequently continue open for years, resisting the usual methods of treatment. Ulcers of any considerable duration are seldom if ever entirely local; the general health becomes deranged, and it is only by combining constitutional and local treatment, adapted to the circumstances of each particular case, that the greatest benefit can be afforded to the patient. To such appropriate

treatment the local use of the chloruret will be found a valuable addition.

M. Lisfranc as before noticed has used the solution of the chloruret of lime of the strength marking three degrees of the chlorometer of M. Gay, Lussac, in the treatment of atonic and chronic ulcers with decided advantage.

The author has used both the chloruret of lime and that of soda as well in the treatment of common ulcers as in those of long standing, and has found the healing process to advance with greater certainty than under the use of the usual applications. When there is much inflammation the use of the chlorurets produces too much irritation to be proper. Sometimes the solution of the chloruret has been combined with the use of cataplasms; but more generally with common dressings, varying the support afforded to the limb according to circumstances.

However desirable in some cases it may be for patients to afford an ulcerated leg complete rest, yet the inconveniences of such a mode of treatment are very great, and by careful dressing, a very considerable degree of exercise may be permitted without injury. In some of the cases in which I have employed the chlorurets, the patients have been so circumstanced as to be obliged to walk from five to six miles daily, and the healing process has gone on favourably under this disadvantage.

Sometimes in old ulcers the surface is foul, the discharge is thin, acrid, and extremely offensive: in such cases I have observed a decided improvement, even during the first week, under the use of the chloruret of oxide of sodium.

The strength of the application should be regulated so as to avoid giving any considerable pain. From three to six proportions of distilled water to one of the concentrated solution, will suffice for ordinary use; but sometimes its immediate application undiluted when the surface is very foul, may be made not only without injury, but with decided benefit. I have witnessed on several occasions the change from a foul grey surface to a clean florid appearance in twenty-four hours, and the relief to the patient's feelings correspond with the alteration in the appearance; but it is not any sudden improvement, which can supersede the necessity of strict and persevering attention: I have known patients inflict upon themselves by a single awkward application of the roller a degree of injury, which has not been recovered from in the course of a month.

I have at this time under my care a gentleman labouring under ulcer of the leg, who informs me that previously to his coming to town his leg had thrice from a tolerably healthy condition of sore, taken on the sloughing process, and each time after an attempt to expedite the cure by

means of pressure. He was confined to his bed for many weeks, and months elapsed before he was enabled to leave his room.

In a case of ulcers of the leg, nearly surrounding it between the ankle and the calf, and which had not been healed during the ten proceeding years, the discharge was copious, acrid and so offensive as to be a great cause of distress to the patient—she was a female, beyond the middle period of life, and had undergone the operation of tying a varicose vein of the diseased leg more than twenty years ago, since when she has seldom been free from ulcers. She was in humble circumstances and obliged to labour for her subsistence. Under the use of the chloruret of oxide of sodium and careful dressing with attention to her general health, which was very imperfect, the ulcers soon assumed a healthy appearance and she was relieved from the pain which she had long suffered : in little more than two months the larger ulcers were reduced to less than half their original size and the smaller ones were healed. As long as she was dressed daily she continued to improve, but she lived so far off as to render her attendance every day extremely inconvenient ; she begged to be allowed to dress it herself, but with the most careful assistance in pointing out to her the mode of performing the dressing, she did not succeed very well in her endeavours. From this time

little progress was made ; she occasionally attends to shew that her leg has not become worse, and is extremely thankful that she no longer suffers the pain as formerly and that she is perfectly free from the noisome smell, which used to distress her.

I might mention other cases ; but as the result has been more or less favourable in all, though in some instances the application has been discontinued in consequence of the extreme irritability of the ulcers, I deem it unnecessary to enter into further detail.

Compound Fracture.

Few of the accidents or diseases which fall under the care of the surgeon, require a higher degree of judgment and of unremitting care than compound fractures. Instances are sometimes met with in which under obvious errors of management patients struggle through ; but more frequently, after long suffering, the patient is doomed to undergo amputation, or sinks exhausted. If we thus occasionally witness loss of life or lameness under imperfect measures, the judicious and successful treatment of compound fractures reflects honour upon surgery ; and it is a circumstance equally creditable to science and to humanity, that many limbs are now saved

after injuries which formerly were considered to call for immediate amputation. In this great improvement, the author believes, the surgeons of our excellent provincial hospitals, and those in practice in the country, have had the merit of leading the way. No one acquainted with the facts will doubt that the practice in the country is more successful than in London; some attribute the difference of result to the purer air of the country; but it is probable that other circumstances have a more powerful influence; since when the same attentions to the ordinary and humbler duties happen to be exerted in town, the air is generally found sufficiently pure to admit of the patients recovery, if the injury be not such as to preclude the attempt. The private practitioner in the country is not above performing the humble but important office of *dresser* himself; the provincial hospital surgeon has also great advantages, inasmuch as the office of dresser generally devolves upon his senior apprentice, who must have passed years as an observer before he be allowed to take upon himself even the subordinate management of patients. In some of our metropolitan hospitals, unfortunately for the patients, a higher fee is required from the dresser than from the ordinary pupil, which makes money rather than merit the qualification: now as the command of means does not insure the highest attainments and moral worth, the meritorious student

whose pecuniary resources may be slender, may be precluded from holding a situation for which he is well qualified, and on whose efficiency the welfare of the patient not unfrequently depends. In a cause so important to humanity, it may become a question, whether, were the situations of house-surgeon, dresser, &c. in our hospitals, instead of being *purchased* by a premium, *conferred* as the reward of merit upon the students who should in a public examination prove themselves the most worthy and competent to perform the duties, a great step would not be gained, both in respect to science and humanity? This is no chimerical proposition: it has for years past been carried into effect in the hospitals of Paris, and great benefits have resulted from the arrangement.

It is not my intention to examine all the circumstances on which the successful treatment of compound fracture depends; but one cause of failure may be traced to the accumulation of putrid discharge on the dressings and bandages, the latter of which are sometimes left about the limb for weeks without being exchanged for clean ones: the motive generally assigned is to avoid the disturbance of the limb; but though it must be injurious to a patient to have the fragments of a bone in a fractured limb moved upon each other, and forced into the softer parts, the objection does not apply to the moving of the

limb steadily, as a whole, without disturbing the natural position of the parts above and below the fracture. Thus cleanliness may be carried into effect without injury.

When the offensive discharge is permitted to accumulate, and when bones are exposed to pus, the peculiar foetor is great, the bedding and every thing about the patient soon become tainted, and the atmosphere around him becomes impure and unfit for respiration either in health or disease: under such circumstances can it be surprising that fever so often supervenes, even after the immediate danger from the local injury has subsided?

One of the important precautions in the treatment of compound fractures, is to prevent or to counteract putrescency: this I have effected before I became acquainted with the chlorurets by much less powerful antiseptics, such as vinegar, pyroligneous acid, &c. aided by strict attention to cleanliness, but the power of the chlorurets of lime or of soda, in destroying putrefaction and animal effluvia, is so fully established, no doubt can be entertained that what *may be effected* by the imperfect means stated above, may be much more completely performed by the more powerful and perfectly safe antiseptics, the chlorurets of soda and of lime.

The same precautions which regulate our use of these agents in the treatment of wounds and

ulcers, apply to compound fractures: it may be further necessary to sprinkle the bandages with the solution, should they be exposed to the contact of the discharge from the wound.

Diseases of the Bladder and Urinary Organs.

In certain diseases of the bladder the urine is rendered offensive and disgusts the patient. The disinfection is effected by putting a few drops of the concentrated chloruret of oxide of sodium into the chamber pot; the same result may be obtained respecting urine voided after having eaten asparagus, only in this case it is necessary to employ a larger quantity of the chloruret.*

M. Labarraque observes, I owe to *M. Ségalas*, who devotes himself in a special manner to the teaching of the diseases of the urinary passages, the knowledge of a remarkable fact, both by the disinfection of the urine in the organ which contains it, and by the relief which the patient has experienced in consequence of the use of the chloruret. I record it here to draw the attention of professional men to analagous cases.

M. G***, aged sixty-nine years, affected with

* *M. Darcet*, member of the Institute, has been enabled by means of a small quantity of alum in powder, to prevent the ammoniacal odour from being developed in the urine voided by patients who drink the waters of *Vichy*.

a paralysis of the bladder, and not passing his urine during several weeks otherwise than by overflowing (*par regorgement*) was during some days afflicted with all that series of accidents which succeeds the forced distension of the bladder, the prolonged confinement of the urine in this viscus, and the supposed passage of a part of this liquid into the blood. The hypogastric region was tense and painful; the urine turbid and ammoniacal, deposited a thick brownish and fetid pus; the tongue was dry, the skin harsh, the chest embarrassed, the voice hoarse and feeble: there was much agitation, and sometimes fleeting delirium. M. Ségalas was called: this physician acquired by the catheter the confirmation of the diagnosis established by the symptoms. An elastic gum catheter, introduced with the greatest facility, gave exit to a great quantity of purulent urine of an insupportable odour. The instrument was allowed to remain during two days, but became several times obstructed. Often, in consequence, injections were practised, but with little success; which determined M. Segalas to introduce a catheter with double tube, and to wash the bladder freely with water, according to the ingenious method of *M. Jules Cloquet*.

These means employed for several successive days, had the effect which was expected: the bladder was freed from the influence of the putrid matters which occupied it, the urine passed with

facility through the catheter, and the condition of the patient was sensibly meliorated, but the urine continued to deposit a *fetid pus*, which sometimes passed almost unmixed through the catheter.

It was under these circumstances that *M. Ségalas* had recourse to the chloruret of oxide of sodium, diluted with sixty parts of water, and carried it into the bladder by the double catheter. A first irrigation of this kind produced *a very sensible diminution in the secretion and odour of the pus*: a second, made forty-eight hours afterwards was followed by similar success, and two other irrigations made at intervals of two days, have placed the patient in a condition to follow his occupations, it being understood that the catheter was introduced for each evacuation of the urine.*

The patient did not experience any painful sensations during the irrigations made with the chloruret thus diluted with water.

In ulcerations of the bladder, the injection of the diluted solution of chloruret of oxide of sodium is particularly indicated.† The author

* Observation communicated to the Royal Academy of Medicine, sitting of 11th August, 1825.

† *M. Ségalas* communicated to the Royal Institute of France, at its sitting of 4th September, 1826, an exposition of a mode of assisting the cure of vesical urinary fistula, and of simplifying the high operation for the stone.

The instrument is constructed on the principle of capillary

has used it, the patients stating that there was no pain or uneasiness induced, except in one instance: this patient had long laboured under extreme irritability of the bladder, and the irritation of passing the catheter only was sufficient to occasion an aggravation of symptoms for several days. In this case the patient complained of pain; the use of injection was immediately given up, and he has continued to improve by milder means, that is by attention to his general health, and carefully avoiding as much as possible all sources of local irritation.

Diseases of the Uterus, &c.

For ulcers of the uterus the chloruret of oxide of sodium should be diluted with from twelve to fifteen, and even to thirty times its weight of pure water, and be used as injections.

attraction. It is no other than a skein of cotton placed within a common gum elastic catheter.

A catheter, No. 12, of three lines diameter, has carried a pint of water from one bottle to another in five hours. The advantages of this simple and philosophical adaptation of an everacting power, namely, capillary attraction, to carry off the urine as it arrives at the bladder, may be of the utmost importance in many instances, and particularly in the ulcerations of the bladder, so as to avoid the irritation caused by the presence of urine in the viscus. The invention is honourable to M. Ségalas, to whom the profession is indebted for other valuable improvements in the healing art.

Prudence requires that this remedy be directed by a professional attendant, who will augment or moderate its action, or even suspend the use of it if needful.

M. Sanson, after having operated upon an enormous uterine polypus, by ligature, in the presence of *Dr. Lefevre*, has seen putrefaction take possession of this extraneous body; he has effected the disinfection by the applications of chlorureted water, and the mortified substance became detached; the operation was followed with success.

In diseases of the uterus and vagina attended with discharges, the chloruret of oxide of sodium properly diluted and used in the form of injection, will be found a valuable auxiliary to such general treatment as may be required. In leucorrhœa the author has employed it with great relief to the patients.

Dr. Elliotson, physician to St. Thomas's Hospital, has used the chloruret in a case of diseased uterus which he had previously considered to be almost hopeless: the patient is now in a fair way of recovery.

In the practice of Midwifery it sometimes happens, whether from any portion of the secundines not being removed or from other cause, that the lochial discharge is kept up beyond the usual period, and becomes so offensive as to taint the bedding, &c. In such cases the patients health

suffers greatly. The injection of a diluted solution of the chloruret of oxide of sodium would at once correct the offensiveness of the discharge, and with proper precautions that the solution be not too strong, nor the menstruum with which it may be combined, so large in quantity nor so low in temperature as to be detrimental, the remedy may be employed with safety and advantage.

Treatment of Burns and Scalds.

M. Labarraque states that M. Lisfranc, surgeon in chief of La Pitié, pursues his brilliant success in the cure of burns and of ordinary ulcers by means of the chlorurets. The memoir which he proposes to publish on this subject, and which he has announced to the Royal Academy of Medicine, will be of the greatest interest.

In addition to the valuable observations of M. Lisfranc on the treatment of burns and scalds, the author begs leave to suggest to surgeons employed for the accidents which happen in collieries, founderies, &c. the use of the chlorurets in the treatment of such accidents, which of late years have unfortunately been too frequent and calamitous in our collieries. In severe burns, the immediate destruction of the vitality of the soft parts is so great, that no expectation can be entertained of restoring their organization, consequently healing can only take place after the

separation of the dead parts, and under such circumstances the healing process is generally very tedious. With the use of the chlorurets the usual attentions, which would be proper when common dressings are applied, should not be omitted.

Various instances in which the use of the Chlorurets has been found beneficial.

Cancer has been disinfected, and experiments are continued on this frightful malady as also on corroding tetters. (Dartres.) Cases of the cure of scald-head have equally been communicated to the Royal Academy of Medicine.*

Herpes. Dr. Bielt, Physician to the Hospital Saint Louis, has made numerous applications of the chloruret of oxide of sodium to herpetic complaints.

M. Sanson, Surgeon in Ordinary at the Hotel Dieu, has disinfected *ulcerations of the mouth*, with caries of the bones of the vault of the palate, and has suspended during some time, the ravages of this frightful malady.

Dr. Lagneau, has made use of the chloruret in injections for the *softening of the gums, with ulce-*

* Case of a cure of *tinea favosa*, communicated to the Royal Academy of Medicine, by Dr. Roche. This affection had resisted the different usual modes of treatment.

rations, exhaling a great degree of fetor. The condition of the patient has been ameliorated, and after each injection, the odour has been destroyed.

M. Reynard, dentist, has wished to employ the chloruret of oxide of sodium, to arrest the caries of teeth, and to destroy the odour of the mouth; but he has observed, that this remedy disagreeably excites the salivary glands; and on that account, he thinks it cannot be employed for the toilet of the mouth.

Dr. Chantourelle, has long since employed the chloruret of oxide of sodium, diluted with ten parts of water, in two cases of putrid sore throat, (*angina gangrenosa*,) and all fetid odour, so dangerous to the assistants and to the physician, disappeared: these two cases have been communicated to the Society of Medicine of Paris. Very recently also, he has derived great advantage from the use of the chloruret taken into the stomach, in the dose of twenty-five drops in a glass of water, to destroy the disengagement of sulphureous gas, which, very greatly troubled a person poisoned by the hydrosulphuret of potash, already expelled by vomiting. His memoir, read at the Royal Academy of Medicine, has given rise to a learned report, which is noticed under the head **ASPHYXIA**.

In *Ptyalism*, and *ulcers of the mouth*, the author has employed the solution of the chloruret of oxide of sodium, with decided benefit; also in

simple and syphilitic ulcers of the throat ; in the more severe affections of these parts in that form of angina, commonly called putrid sore throat, the relief has been almost immediate.

In the affections of the throat, in *small pox*, in *measles*, and in *scarlatina*, the use of the chloruret will prove a most valuable auxiliary, although it would not be safe to trust to a local application only to the exclusion of other means, essential to the welfare of the patient.*

In a case of small pox, under the care of Dr. Roe, Physician to the Westminster Hospital, the apthous and sloughy state of the fauces, was such as to occasion considerable anxiety : there was a large slough adhering to the hard palate, and a thick crust covering the tongue, precluded examination of its actual surface. The patient was bled to the approach of deliquium, and general antiphlogistic treatment adopted, with the free use of a gargle of diluted chloruret of oxide of sodium. These measures were begun on the Tuesday, and on the next Saturday, the patient was free from any urgent symptom ; the sloughs had separated, and the only ulcerated surface, was that of the tongue, which was nearly healed. The patient speedily recovered.

* See Observations on the Inflammations of the Mucous Membranes of the Organs of Respiration, by the author of this work, published in the Medical Intelligencer, 1820.

Ozæna has been disinfected by injections made twice a day with the chloruret of oxide of sodium, diluted in from two to ten parts of water, and this fetid ulcer has been cured.

A similar case came under the care of the author, namely, of ulceration within the nostrils, attended with extremely offensive odour: it occurred in a girl employed by her relations to nurse their children. The odour was so intolerable to her friends, that they were fearful in allowing her to remain in the family. She was directed to use a solution of the chloruret of oxide of sodium to the affected parts frequently, by inhaling forcibly when the nostrils were immersed in some of the solution. At first, she used it but very imperfectly, and probably, without reaching the diseased surfaces, but in the course of a few days she managed better, and the offensive odour was no longer perceptible. The application did not produce pain.

The author has employed the solution of the chloruret of oxide of sodium locally, in ophthalmia, gonorrhæa, and some other inflammations of the mucous membranes, with apparent benefit; but as general treatment was combined, except in some slight cases, he does not feel himself warranted to decide, how far the chloruret may be likely to supersede the means in common use.

In the treatment of a case of *punctured wound received in dissection*, the inflammation was pro-

ceeding up the arm with alarming rapidity, and the pain and tension were extreme : the patient experienced immediate relief from the diluted chloruret of oxide of sodium, used as a lotion, combined with the free use of leeches : rest and abstinence were considered to be essential, and were strictly attended to. The patient recovered without any untoward circumstance.

In *sinuous ulcers, connected with diseased joints*, the benefit derived from the injection of diluted solution of the chloruret has been very obvious. The fœtor attending the exfoliation of portions of bone has been thus corrected, and the sinuses have soon become consolidated, after the exfoliation has taken place. In one case of diseased ankle, in which the chloruret, in conjunction with other remedies, was used ; the patient had quitted an hospital, because he would not submit to amputation, which had been strongly urged : ankylosis of the ankle joint had taken place ; but the extent of motion subsequently acquired in the articulations of the tarsal and metatarsal bones, enabled him to walk with a degree of freedom that could not have been anticipated.

In another case of diseased elbow joint, (the patient a boy of scrophulous diathesis,) repeated abscesses and sinuses formed around the joint, which was greatly enlarged. For many months the total immobility of the forearm upon the arm, rendered it probable that ankylosis might be the

most favourable result that could be obtained: in addition to the careful employment of the usual means of treatment, the solution of the chloruret was conjoined, both as lotion and injection: great care was taken to improve his general health: fortunately, these means have been so far successful, that he has regained a considerable degree of motion in the joint, his general health is greatly improved, and there remains but little enlargement, and only two superficial ulcers. The progress of this and the preceding case, was observed by Dr. Filkin, and other professional friends.

On the use of the Chlorurets in the treatment of Asphyxia, and in cases of Poisoning by the Sulphurets of Potash and Soda.

The researches and experiments very recently made by M. Laurens, Professor of Chemistry and Pharmacy, at the Secondary School of Medicine at Marseilles, have shewn, that the chloruret of lime possesses the property of neutralizing the deleterious effects of carbonic acid. Birds, which had been reduced to a state of asphyxia, by means of this acid within a bell-glass, were brought to life the moment that M. Laurens caused a small quantity of this chloruret to be introduced under the bell-glass, which was placed over a mercurial trough. This distinguished chemist, having been afterwards afflicted with a violent head-ache, by

the vicinity of a pan containing charcoal recently lighted, was suddenly relieved from it, by respiring (the vapour of) chloruret of lime. These two curious facts, indicate to us new applications, which had remained hitherto unperceived, of the invention of the celebrated and beneficent M. Labarraque, in relation to medicine and domestic economy. Thus we may now employ the chlorurets with advantage, in the kitchens of citizens, in the workshops or places where ironing of fine linen is performed, and in all confined and badly aired places, where the privation of a sparkling fire, as among the poor, leads to the use of charcoal. (*Guide Sanitaire*, p. 804.)

At the sitting of the Royal Academy of Medicine of the 24th May 1825, Dr. *Chantourelle* read a memoir on the action of the *sulphurets of potash and soda*, containing two cases of poisoning by these substances. In the one of these cases an ounce and a half of sulphuret of soda swallowed produced only an inflammation of the stomach which was not mortal. Mucilaginous drinks taken in great abundance to induce vomiting of the poison, and the addition in each cup of these drinks of a table spoonful of the solution of the chloruret of oxide of sodium of M. Labarraque, to decompose it, were the means at first employed; afterwards the inflammation of the stomach and intestines was combated by the usual antiphlogistics.

In the other case four drams of the sulphuret of potash swallowed produced so sudden and abundant a disengagement of sulphureted hydrogen gas, that the patient immediately perished by asphyxia, and without the poison having time to produce its corrosive and inflammatory action upon the stomach and the other digestive organs. From these two facts Dr. Chantourelle concludes that the sulphurets are at the same time escharotic and suffocating poisons, and that in the appreciation of the symptoms which result from swallowing them, as in the choice of the means to oppose them, regard must be had to these two kinds of effect. (*Archives T. VIII. p. 284.*)

At the Royal Academy of Medicine, Section of Medicine, July 12, 1825, Messrs. Burdin, Husson and Ferrus made a report on these two cases. The reporters agree with Dr. Chantourelle that the sulphurets kill, sometimes by producing asphyxia when there is a rapid disengagement of sulphureted hydrogen gas, and at other times by exciting a strong inflammation of the stomach and intestines. The reporters proceed to give some details of the uses which have been made of the chloruret by M. Labarraque and others.

A discussion followed in which in answer to a question by M. Marc, whether when the sulphuret of soda kills quickly it is not by its caustic effects, M. Orfila answered that in these cases it is certainly the liberation of the sulphureted

hydrogen gas which causes death : and he gave as a proof that sulphur is then always found in the stomach ; and it is only thus that the chloruret of oxide of sodium is useful in destroying the gas which produces asphyxia. M. Caventou remarked that it is long since chlorine has been employed, not only to neutralise sulphureted hydrogen gas but also as an antidote against poisonings by this gas. M. Orfila replied, that, as the respiration of chlorine often produced accidents, it was an advance in science to have thought of employing the chloruret of oxide of sodium. (*Archives T. VIII. p. 603.*)

An interesting case of Asphyxia, successfully treated by M. Labarraque, is related in the eighth volume of the *Archives*. Mr. L. had read the particulars to the Society of Medicine. It occurred in August, 1824.

A workman of a vermicelli maker was exposed to a current of deleterious gas, which proceeded from an accumulation of filth and rubbish heaped together from a pit of night-soil which was undergoing repair. He fell without consciousness. M. Labarraque was called to the patient soon after the accident, the symptoms were ; pulse strong, but fugitive on pressure, excessive rigidity of the limbs ; arms stretched, stiff and almost cold ; head thrown backwards ; veins of the neck turgid : face violet coloured, also the lips, which were much swollen ; eyes closed, dull and insen-

sible; respiration appeared extinct; the danger seemed imminent. The physician did not arrive; vinegar, æther, and strong ammonia placed under the patient's nostrils produced no effect. The sensibility could not be recalled. M. Labarraque details the train of reasoning which led him to adopt immediately the concentrated solution of the chloruret of oxide of sodium. A napkin moistened in the solution was placed under the patient's nostrils and in less than one minute he uttered an acute and plaintive cry or groan: the rigidity ceased; his eyes opened to shut again in a few seconds: the tetanic rigidity had reappeared with its frightful train. I (Mr. L.) had withdrawn the chloruret too soon. The usual stimulants again tried produced no effect. The chloruret was reapplied: in less than a minute the rigidity of the limbs ceased and the patient sent forth a piercing cry, which was stopped by the linen impregnated with the chloruret. A full inspiration took place, the air necessarily passing through the moistened linen, was therefore charged with chloruret saturated with water. The disinfection of the gas contained in the chest was no doubt complete, since the symptoms ceased. He was made to walk into the street, keeping the chloruret under his nostrils. His countenance regained its natural appearance. Two spoonfuls of an æthereal potion were administered and he was soon in a condition to resume his work; but

this was not deemed prudent after so severe a shock. Repose and the open air were prescribed.

The patient's name was *Jean Deliax*. He recovered his health as perfectly as before the accident.

Another case of Asphyxia, very similar in its cause, treatment and fortunate result, has been related in a former part of this work. (Page 42.)

On the internal use of the Chloruret of Soda.

Of the internal use of the chloruret of oxide of sodium, little information has yet been communicated to the public, and it is probable that its value as an internal remedy, remains in a great measure, to be ascertained.

The use made of it by M. Jules Cloquet and Dr. Chantourelle, as well as that recommended by the Sanitary Council of Marseilles to patients labouring under plague or infectious fevers, may suffice to remove all fears of its safety, when properly administered, as an internal remedy. The author has employed it in erysipelas and in some disordered states of the stomach with beneficial effects; but he considers it of more importance to science and to humanity to direct the attention of his professional brethren to the investigation of its antiseptic properties as an internal remedy, rather than to dwell upon the very little at present known respecting it.

General Observations on some of the uses of the Chloruret of Oxide of Sodium.

"M. Labarraque observes, (*De l'Emploi des Chlorures, &c.*) that the formula which he has published in his memoir (what memoir he alludes to is not specified) ought to be exactly followed in the preparation of the chloruret of the oxide of sodium, for if the formula be deviated from, the properties of the product are changed and its action may be *null*: whilst if the chloruret possess all its properties we are certain of *always obtaining* the effects related in his notice.

M. L. further observes, judicious practitioners after having read his preceding observations, have been able to appreciate the cases in which the application of the chloruret of oxide of sodium ought to be followed by a happy result, and thus to enlarge the domain of therapeutics, by indicating with precision the affections which require its use; that it would be fastidious to name all the justly celebrated physicians and surgeons who have studied the action of the alkaline and earthy chlorurets; but he (Mr. L.) cannot avoid pointing out to the friends of humanity, *Dr. Bielt*, physician to the Hospital Saint Louis; *M. Jules Cloquet*, adjoint surgeon in chief of the same hospital; Professor *Marjolin*, surgeon in chief of the Hospital Beaujon; *Dr. Ségalas*, associated professor at the Faculty of Medicine; *M. Sanson*, surgeon in ordinary at the Hotel Dieu; *Dr. Lefevre*, *Dr. Lagneau*, *M. Lisfranc*, surgeon in chief of La Pitié, and others.

In general we may deduce from all that has been observed in the use of the chloruret of oxide of sodium on man, that this liquor is calculated to destroy the fœtor of wounds, to change their nature, and to alter their condition to that of simple wounds; that it is especially efficacious in atonic ulcers, the sloughing sores of hospitals.

gangrene, &c. &c. It may be employed pure or diluted with one, two, or even to eight parts of water ; it may be used in the form of lotion, and we are careful to cover the wounds by means of dossils of lint moistened with this liquor. The dressing is performed twice a day ; we ought to leave off using it whilst the wound is red and inflamed, and the dressing is made in this case according to the attentions prescribed in treatises on surgery.

Mr. L. further observes, I might multiply these citations infinitely, either in relating the facts of the medicinal applications of the chlorurets in France and the Colonies, or in reporting the authentic disinfections performed under our inspection, or that which has been made at St. Domingo, by order of the Government of that country, and of which the *procès verbal* is inserted in the *Gazette officielle* of 20 Feb. 1825 ; but this would be travelling beyond the limits of this notice, which ought only to be considered as the extract of a more extended work, in which I shall endeavour to demonstrate the causes and the phenomena of the putrefaction of animal substances, followed by the mode of arresting this disorganizing process under different circumstances."

On the use of the Chlorurets in Veterinary Surgery.

The following statements by eminent veterinary surgeons in France, furnish valuable evidence of the assistance which this branch of surgery may derive from the judicious use of the chlorurets. The laudable exertions made by those in our own country to raise veterinary surgery to the rank of a science will no doubt lead them to give a fair trial to a remedy which seems to have been equally beneficial in some of the destructive diseases of cattle, as it has been proved to be useful in many of the most dangerous diseases incidental to man.

M. Labaraque observes :

“ The fatal disease of cattle which has prevailed for several months amongst horses has furnished me the opportunity of proving the effects of the chloruret of oxide of sodium on the carbunculous affections with which these animals are very often attacked. We may judge of these effects by the note which *M. Bouley, Jun.* veterinary surgeon, has caused to be inserted in the *Recueil de Médecine Vétérinaire*, June 1825, and which I think it useful to relate entire.”

Note on the Use of the Chloruret of Oxide of Sodium in the treatment of gangrenous tumours, by M. Bouley, Jun.

“ All the veterinary surgeons who have employed setons in the treatment of horses attacked by the epizootic disease have

been enabled to remark that these means were almost always useless and often dangerous; I have, in my own practice, observed eight carbunculous tumours which have been the result of their application. Five of the animals which were affected with them have died, the three others have been cured. The first five have been treated by cauterization, and by antiseptics internally; and the three others by the same means and the use of the chloruret of oxide of sodium of *M. Labarraque*.

“The happy effects which I have obtained from this remedy, determine me to make it known, with some details of the circumstances under which I have employed it, and the results which it has produced.

“*Case the First.* The thirty-first of last March, a bay-horse, aged five years, belonging to the Count d’Yssy, was attacked with the prevailing disease. A rational treatment was used, to combat this affection, which did not present any alarming symptoms till the fifth day, when a considerable tumour, but little painful, manifested itself, (about the breast,) in the very place where two setons had been placed some days previously, and took on, in a short time, all the characters of carbuncle. I hastened to suppress the setons, and at the same time, caused from twelve to fifteen points of the actual cautery to penetrate into the swelling, and I prescribed the extract of gentian and camphor, in convenient proportions. These means did not produce the effect which I expected, and in the course of the night, between the fifth and sixth day, the disease made rapid progress: (*new cauterization, same treatment.*) At length, the seventh day, the tumour, which had become enlarged, discharged a sanious, fetid humour, of a peculiar odour, which left no doubt of the existence of gangrene; the prostration of strength was carried to its height, and every thing announced a very speedy and fatal termination. Such was the almost desperate state of this animal, when *Dr. Ségalas* saw it, and advised me to employ the chloruret of oxide of sodium of *M. Labarraque*, assuring me that he had obtained from it marvellous effects on man, in a similar case. I hastened to profit by the advice of this learned physician, and I immediately caused injections of the chloruret to be made into the openings made by the actual cautery: these injections were practised every hour, and the

wounds dressed immediately afterwards, by means of cut tow ; I also caused frequent aspersions of the same liquor, diluted with five or six parts of water, to be made in the stable.

Calculating from the moment when I employed the chloruret of oxide of sodium, the tumour no longer made any sensible progress, and the disagreeable odour which it exhaled, partly disappeared. From the fourth to the fifth day, the eschars began to fall off, suppuration was established, and all danger ceased; in fine, the considerable wound, which resulted from the falling off of the gangrenous parts, cicatrized speedily, and in less than a month, this animal was in a condition to resume its usual work.

“ Second and Third Cases. Two horses out of age, belonging the one to M. Ingé, butcher in Paris, the other to M. Renoult, cultivator at Yvry, were affected with the prevalent disease in the course of May, and both suffered the same accident as the preceding, in consequence of the applications of setons. These two animals were treated, and cured by the same means, in the space of twenty or twenty-five days.

“ I do not pretend that the chloruret of oxide of sodium is a panacea against gangrenous tumours, neither do I believe that this medicine alone can suffice; but I believe that this remedy is a powerful auxiliary, and I am authorized by facts to believe so, since the first five horses which I have treated solely by the cauterization and tonics died; whilst those which have been submitted to the action of the chloruret have been cured.”

M. Chanas, Veterinary Surgeon to the Gendarmerie of Paris, made a deep and very extensive incision on each side of the neck of a horse, upon a carbunculous tumour, which in a few hours had increased considerably, and which afforded no sign of sensibility. He then caused tow moistened with concentrated chloruret to be placed upon the incisions. At the end of four hours, the animal suffered pain. The dressing with the same liquor, was made morning and evening, during five days, the tumefaction has diminished progressively, the cicatrix formed in a short time, and the horse was cured. Messrs. Dupuy, Girard, Jun. and Vatel, Professors at the School of Alfort and Berger, Veterinary Surgeon to the Gardes du Corps,

have likewise proved the properties of the chloruret in these affections.

M. *Dard*, a young veterinary surgeon, has written to me on the 17th July, 1825, "the good effects which I have obtained from the chloruret of oxide of sodium in several cases, and particularly in the treatment of a glandered horse, which at present is in complete cure, induced me to repeat this remedy upon another horse affected with a disease almost equally intractable, the farcy." I relate this fragment of letter to invite medical men to make experiments.

Instructions for disinfecting and purifying the stables of the Gardes du Corps du Roi, and of the Gendarmerie of Paris have been arranged. (See page 34.) There is cause for congratulation that they have been followed exactly. The disease has ceased its ravages. A great number of proprietors have likewise obtained good effects from the use of chloruret of oxide of sodium to purify their stables, and ox-stalls and sheep folds. M. *Girard*, formerly professor and director of the school of Alfort, in the third edition of his *Notice sur la maladie qui règne épizootiquement sur les chevaux*, has thought it useful to print these instructions, which he has introduced by a note thus expressed :—

"This liquor, employed with advantage by Messrs. *Bouley jun.* and *Vatel*, destroys quickly the fetid odour which the tumours exhale, facilitates the falling off of the eschars, and appears to be a powerful antiseptic. We think it right to place here a note of M. *Labarraque*, who first proposed the use of this remedy, already advantageously known in medicine." (See page 34.)

It would be vain to expect success under all circumstances from any remedy, whether applied to men or to the lower animals, more particularly should it happen that whatever might be the appropriate general treatment, neither that nor the quality of the preparation used should have excited attention ; M. *Girard* mentioned at the sitting of the Royal Academy of Medicine of the

5th July, 1825, that he had vainly applied this remedy upon a horse which had a gangrene of the tail; but the disease continued to make progress. M. G. does not mention any further particulars.

It is probable that should the same application be used in a case of *gangrena senilis* of the human body, arising from exhaustion or constitutional cause, no other result could be expected from any local remedy, than that the disease should advance.

On the preparation of the Chlorurets.

M. Labarraque, in a note read to the Society of Medical Chemistry, the 13th March, 1826, observes :

“ When a therapeutic agent comes into general use, it is indispensable to regulate its mode of preparation, that the substance may be identical every where. He desires that these formulæ may produce this effect. The first (the chloruret of oxide of sodium,—*chlorure d'oxide de sodium*,) is especially employed in topical and external application to wounds and ulcers affected with hospital gangrene, or of which the character is gangrenous; the other (the chloruret of oxide of calcium,—*chlorure d'oxide de calcium*, or simply expressed, chloruret of lime), serves for the disinfection of amphitheatres, of sick wards, and of all places become unhealthy by the presence of putrefied animal matters.

Chloruret of Oxide of Sodium.

Pure carbonate of soda*	. 2½ kilogrammes
Distilled Water	. . 10 kil.

* The sub-carbonate of the London Pharmacopœia.

Mix, and assure yourself, that the liquor marks twelve degrees by the areometer (pèse-sel) of Baumé. If the liquor be too concentrated, which might happen if the salt have effloresced, add the necessary quantity of water to bring it to the degree indicated. If, on the contrary, the solution be too weak, a sufficient quantity of the carbonate of soda must be added.

If the carbonate of soda constantly retained the same quantity of water, it would only be necessary to fix the precise doses; but this salt is far from being at all times identical.

The liquor is put into a vessel of sufficient capacity that about one fourth may remain empty.

We dispose upon a sand bath, a glass balloon of four pints, with long neck and wide mouth, into which the following mixture is to be introduced.

Hydrochlorate of Soda (common salt) 576 grammes
 Peroxide of Manganese, in powder* 448 grammes

To the opening of the balloon, is luted a large bent tube, and an S tube, for the introduction of the diluted acid. The first tube dips into a vessel containing a small quantity of water, and from this same vessel, a large bent tube proceeds to, and dips into the flagon or vessel containing the saline solution.

The apparatus being conveniently disposed and the lutes well dried, the diluted acid, cold and mixed some hours previously with the water, is poured through the S tube, in the following proportions :

Concentrated sulphuric acid 576 grammes
 Water : 448 grammes

The fire is applied under the sand bath, and is directed gradually, till the disengagement of the chlorine ceases.

* The quantity of peroxide of manganese, would be too considerable, if this substance were always found of the first quality in commerce. Its excess does not in any case seem to be hurtful.

The operation terminated, the apparatus is unluted, and the discolouring or bleaching power of the product is examined.* For this purpose one part of the chloruret is introduced into the *berthollimeter*† and a solution of indigo is poured upon it, prepared as follows :

Bengal Indigo powdered	.	.	.	1 part
Concentrated sulphuric acid	.	.	.	6 parts

Apply heat, and afterwards dilute with 993 parts of distilled water.

The chloruret ought to discharge eighteen parts of sulphate of indigo. It is essential to make two or three proofs of discoloration.

After the first, which is made by feeling one's way, the second ought to be made briskly, by adding at once the whole quantity of the solution of sulphate of indigo, which the preceding proof had required to arrive at a deep green. In acting promptly the discoloration is more decided (as observed by M. M. Gay-Lussac and Welter ;) which obliges us to make a third proof, after having added some parts of the sulphate of indigo to the second, to arrive at the green colour, and in keeping account of this addition in the last experiment, which is the most conclusive.

If the solution of carbonate of soda be not sufficiently saturated with chlorine, a current of this gas should be again passed through it, to bring it to the fixed point.

* It might save much inconvenience either to have a stop cock at the bottom of the vessel, or to withdraw, by a tube passed through the safety tube, a portion of the solution for the purpose of examination, before the apparatus be unluted. If the tube conveying the chlorine do not pass sufficiently near to the bottom of the alkaline solution, the upper part may be fully impregnated, whilst the lower portion of the liquid may not be of the required strength. This remark has been verified by Mr. Morson, who has paid considerable attention to the preparation of this chloruret: his apparatus is furnished with stopcocks, by which a portion of the preparation may be withdrawn for examination at any period during the process—ED.

† A simple graduated tube or measure will answer the purpose.—ED.

M. Labarraque adds, that he has here entered into superfluous details for the instructed apothecary, but although minute for practised chemists, these details have appeared to M. L. indispensable in the preparation of a medicament, which till very lately had not been employed in medicine. He recommends that the preceding process should be followed to the letter, so as to obtain always an identical product, and thereby the same beneficial results; for it is known that in the preparation of certain medicaments, the mode of preparing them modifies their external characters and even their virtues.*

Chloruret of Oxide of Calcium.
(*Chloruret of Lime*).

The process by which M. Labarraque makes this preparation is as follows:

Caustic lime is sprinkled with a small quantity of water, and allowed to slake completely. This damp powder is mixed with one twentieth part of hydro-chlorate of soda, and put into vessels of earthen ware of an elongated form, into which the chlorine arrives. This gas is disengaged from a mixture similar to that employed to prepare the chloruret of oxide of sodium. Several apparatus are placed by the side of each other, according to need, always being careful that the chlorine arrives slowly into each of them, so that the combination

* Mr. L. further adds, "I hope to be pardoned for this solicitude, when it is with this product as it is with all the produce of the hands of men, nothing is perfect. Very clever chemists, thinking perhaps that advantageous modifications might be made in this process, have made chlorurets which have not produced the same effects as those which I had caused to be tried. Nevertheless, I have not made any mystery respecting it, I have described the process with all the care of which I am capable; but it is impossible that this description should supply the habit of making it on a large scale, and of often performing the same operation."

The author deems it simply an act of justice to M. Labarraque to state that he has found the chlorurets, obtained from Mr. L. at different times, very uniform in strength, and possessing the same medicinal properties.

may be made successively. This condition is essential to the success of the operation.

The hydrated lime, being sufficiently charged with chlorine, becomes moist, and on this phenomenon we are aware that the operation draws near to a close.

To assay its point of saturation, one part of this chloruret is diffused in one hundred and thirty parts of water, and this solution ought to destroy the colour of four parts and a half of sulphate of indigo.

Mr. L. observes, the chlorometer of the celebrated Gay-Lussac (described in another part of this work) is much more exact; and it is of this instrument that we ought to avail ourselves to examine this chloruret, if we wish to employ it for degenerated burns, as M. Lisfranc has done with success.

For disinfections, the essential point is to saturate the mixture with chlorine, and the purity of the bases is less necessary for chloruret for this purpose than for that which is employed upon living beings.

In considerable establishments, such as hospitals, &c. where daily disinfections may be required, we may make liquid chloruret of lime, and the following is the process:

Put into forty litres of water half a kilogramme of hydrochlorate of soda, and one and a half kilogramme of slaked *quick* lime; a tube must be conducted to within a few inches of the bottom of this liquid, (which must be stirred with a wooden spatula), to conduct the chlorine disengaged from a mixture which may be one half less considerable than that which has been indicated to obtain the chloruret of oxide of sodium: the discolouring property of this liquid chloruret must be tested; it will be too strong for the disinfection of the wards and of putrid animal substances; it must be diluted with a sufficient quantity of water, and may be used for sprinklings."

Such are the directions of M. Labarraque. The apparatus is essentially that of Woulf.

To those in the country who may not be able to procure the chlorurets without inconvenience,

it may be useful to suggest that these preparations may be made with sufficient accuracy for disinfection, by means of a sand bath, (which may be a common flower pot filled with sand) a few wide-mouthed bottles, and bent tubes, made either of lead or glass, without any expensive apparatus. The greatest inconvenience to be guarded against, is the escape of the chlorine gas, which is very irritating and even dangerous if respired in considerable quantity. The tubes should be passed through corks or bungs fitted to the mouths of the vessels and any deficiencies corrected by common luting, a resinous cement, or even by stiff glazier's putty. Should any of the chlorine escape, it may be rendered harmless by sprinkling freely, hartshorn, or other ammoniacal solution, which rapidly absorbs and reunites with the chlorine. In making the chloruret of soda, it will be found convenient to pass a tube from the last vessel, to another containing cream of lime, which will absorb the superfluous gas; which might otherwise escape into the apartment.

From the trifling cost at which these articles can be manufactured on the large scale, when compared with the valuable uses to which they may be applied, advantages which would be freely purchased at any cost, by those capable of appreciating them; it is not very probable that the chlorurets may be made on a small scale, except for the purposes of experiment.

It cannot be uninteresting to the reader, to peruse the following statement of a manufactory perhaps unequalled throughout the world, and equally creditable to the enterprise of the highly meritorious individual to whom it belongs, as to the useful arts of this kingdom. The statement is copied from the American Journal of Science and Arts, (Vol. x. No. 2, February 1826), and was communicated to the editor of that journal, by an American gentleman, dated Glasgow, Nov. 25, 1825.

“Bleaching Powder, Sulphuric Acid, Alkalies, &c.

“I was much interested in the manufactory of Mr. Charles Tennant, near this town, whose personal liberality and intelligence are not less gratifying than the results of his ingenuity. The original object was the manufacture of the bleaching powder, now so extensively used: but he has combined several others with it, in a manner which materially contributes to the success and profit of the whole. The buildings of the establishment, cover a space of five or six acres. One large section is devoted to the manufacture of sulphuric acid. The nitre, instead of being combined with the sulphur in this operation, is placed in a separate portion of the furnace, and its gas is evolved by the heat of the burning sulphur. There are thirty furnaces, and an equal number of leaden chambers, seventy feet in length, twenty in breadth, and sixteen in height, for the condensation of the acid, which appear as if they were competent for lodging the inhabitants of a village. A large part of this acid is employed in the production of chlorine for the use of the manufactory, and is therefore condensed only to the degree necessary for this process. The remainder is rectified by distillation in platina retorts. There are nine of these vessels, holding fifty gallons each, and weighing five hundred

or six hundred ounces. Their value cannot be estimated at less than 2,500 (dollars) each; or 22,500 (dollars) for the whole; and yet it is believed to be more economical than to employ the perishable vessels of lead. Mr. Tennant informed me, that they appear to suffer no diminution or decay, but are liable to bend and break from the intensity and continuance of the heat. The whole produce of sulphuric acid is about 12,000 gallons weekly.

“The next process in order, is the formation of the chlorate (CHLORIDE, Ed.) of lime. There are fifteen or twenty leaden retorts for the evolution of the chlorine, about five feet in diameter, and weighing nearly three tons each. They are heated by steam, and the usual materials are employed for the production of the gas. Within two years, the inconvenient apparatus formerly employed for the impregnation of the lime, has been greatly improved by the ingenuity of M. Tennant. The gas from the retorts, is passed into six chambers of hewn stone, about thirty feet long, twenty wide, and six high, which are covered with wood, and rendered impervious to the gas, by a resinous varnish. The lime is placed in shallow boxes at the bottom of these chambers. It is agitated during the process by iron rakes, inserted through a box filled with lime which serves as a valve. The impregnation is generally completed in two days, when the supply is renewed by means of wooden doors which are luted in. So accurately is every part of the apparatus fitted, that in the building containing these immense volumes of imprisoned gas, there was no disagreeable vapour, and the gas was not so perceptible as it usually is in a laboratory where a small quantity is forming for mere experiment. The powder, when completely formed, even in large quantities, has no perceptible odour, and thus shows the accurate manner in which the process is conducted.

“The remainder of the establishment is employed in turning the residue of these processes to account, the sulphates of soda and potash are converted into the alkaline state, by two successive burnings, in union with bituminous coal, and three lixiviations and evaporations. About eighteen tons of sub-carbonate of soda in its purified state are produced weekly. By two successive crystallizations it is formed into large rhom-

boidal tabular crystals, and surpasses in beauty, any specimens of the article I have ever seen produced in the large way. A part of the alkali is taken at an intermediate state, and employed in the last section of the manufactory, in the making of soap. It furnishes the chief supply of this article for this city, and the surrounding country. Some idea may be formed of the extent of this establishment, from the fact that it requires a daily supply of sixty tons of coal, and twenty tons of lime, and the completeness of the parts is quite as surprising as the magnitude of the whole. It is only doing justice to the proprietor to state that it is the result of individual enterprise and ingenuity, operating at first on a small scale."

In the *Journal de Chimie Médicale*, for November, 1826, M. Payen has furnished an article *On the preparation of the Medicinal Chloruret of Soda*, (a very appropriate name for the article, and less liable to objection than most of its synonymous terms,) which is creditable to its author as well for the analyses which he has made of the relative strength of the chlorurets of lime and of soda, as the candid and handsome manner in which he has submitted his observations "to the enlightened philanthropist who has consecrated the use of one of the most useful therapeutical agents."

The chief of his objections to the formula of M. Labarraque apply rather to the probable errors that may be committed by deviating from Mr. L's directions than by following them. Two or three seem valid as relating to Mr. L's process, namely, the difficulty of regulating the heat of a sand bath; and the varying quality of indigo by which the product is examined; and the excess of alkali beyond that which combines to form a neutral chloruret. The former of these difficulties may be easily obviated by substituting a water bath, or steam, for the sand bath; and the chlorometer of M. Gay-Lussac, which M. Labarraque points out to be more exact than the simple method of testing the product which he describes, enables the chemist to arrive at sufficiently accurate results by indigo of any quality, a definite quantity of chlorine gas being the standard of comparison. M. Payen's objections apart from technicalities, amount to this: that a description, however exact, cannot

confer intellect, adroitness or dexterity upon those who have never paid the price of observation, study and labour, by which alone skill can be purchased; and therefore—they will blunder.

The following formula for the preparation of the Medicinal Chloruret of Soda is recommended by M. Payen, on account of its extreme simplicity; he states that it has received the sanction of experience, by trials of its application to the living body; but Mr. P. is silent as to the number of instances or the nature of the diseases in which it was used.

{	Chloruret of Lime at 98° of Gay-Lussac's	}	500 grammes.
	Chlorometer		
{	Christallized subcarbonate of Soda	1000	
	Water	9000	
.... Produce about ten litres of Chloruret of Soda.			

To prepare a neutral chloruret by the same process, it will suffice to use 690 grammes of subcarbonate of soda instead of 1000.

Dissolve the chloruret of lime by diffusing it by means of a plunger, in six kilogrammes of water added successively in small portions: leave it to subside for three hours and draw off the clear liquid, which is to be filtered; pour the deposit upon the same filter, and wash it with a kilogramme of water added at eight successive times.

Dissolve the subcarbonate of soda with heat in two kilogrammes of water; allow it to cool and mix together the clear solutions: an abundant precipitate is formed which may be left to subside for some hours (if in haste the filtration may be performed immediately); the clear liquor is separated by filtering as it flows: the deposit is added upon one or more of the strainers, and when it no longer affords drops, the whole of the clear solution is bottled, corked hermetically and sealed.

The deposits are of a brilliant white, washed with lotions of water which carry off the last portions of the liquid it contained; the weak solutions which result are employed instead of water to dissolve the chloruret of lime for subsequent use.

The chloruret thus produced Mr. P. states to be of the same strength and properties as the chloruret of oxide of sodium of M. Labarraque.

The length to which the preceding articles have extended prevents the addition of many details, which, though interesting as they relate to a new remedy, are not essential either to its manufacture or medicinal use.

Baumé's Areometer, pèse-sel or pèse-liquor. (See
PLATE, A and B.)

This instrument is simply a hydrometer for ascertaining the specific gravities of liquids heavier than water. The zero marks the depth to which the stem sinks in distilled water: the principal divisions of the scale are ascertained by immersing the instrument in saline solutions of definite proportions. Thus to mark 15 upon the scale, we should dissolve 15 parts of very pure and dry sea salt in eighty-five parts of water forming 100 parts of liquid: the depth to which the stem sinks is the point required: the division of the space from 0 to 15 affords the units. The temperature of the liquid used for graduating the scale should be marked and the same temperature be observed when liquids are to be examined by the instrument. Tables of equivalents are contained in most elementary works on Chemistry. Twelve degrees are equal to the specific gravity 1,089.

Chlorometer of M. Gay-Lussac:

The description of the Chlorometer of M. Gay Lussac and the mode of using it subjoined are from the *Annals of Philosophy*, New Series, Vol. VIII. The original may be found in the *Annales de Chimie*, and also separately published at Paris, 1824, under the title of "*Instruction sur l'Essai du Chlorure de Chaux; par M. Gay-Lussac.*"

In the very able translation by Mr. Children, contained in the *Annals of Philosophy*, the table of the relative value of the various qualities of oxide of Manganese, from analyses by M. Berthier, is omitted: to the manufacturer on a large scale, this knowledge may be of some moment; as the difference between the product of chlorine furnished by one kilogramme of pure

manganese and the lowest on the list is as o^k , 7964 to o^k , 2789.

The terms *chlorure*, *chloruret*, and *chloride*, are synonymous.

Instructions for the Assay of Chloride of Lime.

By M. Gay-Lussac.

“ The uncertainty which has hitherto existed in the modes of ascertaining the quality, and consequently the commercial value of chloride of lime, and in no small degree retarded its coming into general use, has determined me to publish the following instructions on the subject. I shall divide the work into two parts; in the first I shall expose the principles on which the assay of the chloride of lime is founded, and in the second I shall describe the instrument which I call a *Chlorometer*, and the manipulations necessary for making the assay with sufficient accuracy for the purposes of those arts in which chlorine is employed.

PART I.

Principles on which the Assay of Chloride of Lime by means of Indigo is founded.

It is known that chlorine destroys vegetable colours, by forming new compounds with their component principles. It is in consequence of this property which it possesses, whether in the state of gas, in solution in water, or in combination with an alkali, that it is employed in the arts of bleaching, calico printing, &c. The same quantity of chlorine, in either of those three states, destroys the same quantity of colouring matter; and since by combination with an alkali, it becomes fixed, has scarcely any smell, keeps better, is more portable, and more capable of concentration, the advantages of preparing it in that form are obvious.

Caustic potash, soda and lime, and even their carbonates, combine very readily with chlorine. Its combination with the potash, or soda of commerce, has long been known in France by the name of *eau de javelle*; that with lime was called oxymuriate of lime; but it is more accurate to denominate the first, as is now

* From the *Annales de Chimie*.

generally done, chloride of potash or soda, and the latter chloride of lime.

The chlorides of potash, soda, and lime, have very little stability of composition; the two first, indeed, can only be obtained in the liquid state, in a large quantity of water. If, for instance, we pass chlorine into a concentrated solution of potash, at first chloride of potash will be formed; but this chloride will soon be decomposed, and converted into *chlorate of potash*, and *chloride of potassium*. The two latter compounds, not having the property of destroying colours, must be avoided, and the only means of preventing their formation is to employ a very weak solution of the alkali, which, at most, should not exceed the proportion of 125 grammes to a litre of water. (In round numbers, about $4\frac{1}{2}$ oz. potash to $2\frac{1}{4}$ pints of water.)

Lime has not, like potash and soda, the inconvenience of converting the chlorine into chloric acid; it may consequently be combined with the chlorine *en masse*.

Lime, if perfectly dry, does not absorb chlorine, but it combines with it rapidly when in the state of hydrate, that is, after it has imbibed a sufficient quantity of water from a moist atmosphere, to split and fall to powder. Supposing it to be in the state of hydrate, it forms, according to M. Welter, a sub-chloride of lime, which is composed of*

2 proportions of lime	=	2	×	35.603	=	71.206
2		water	=	2	×	11.2435
1		chlorine				= 44.2653
						<hr/>
						137.9583

* Sub-chloride of lime, according to Mr. Dalton, is constituted of

Chlorine	23
Lime	38
Water	39
<hr/>	
100	

Dr. Henry supposes it altered, to correct defects in the analysis.

Chlorine	24.36	=	1 atom	36
Lime	38.54	=	2 atoms	56
Water	37.10	=	6 atoms	54
<hr/>				
100.		<hr/>		
		146		

(ED.)

When mixed with water it is immediately decomposed; one half of the lime is precipitated, and the other half remains in solution, combined with the whole of the chlorine, and consequently forming a neutral chloride. Hence there are two combinations of chlorine with lime, a sub-chloride, and a neutral chloride. The sub-chloride is obtained by saturating hydrate of lime with chlorine, and the neutral chloride by dissolving the sub-chloride in water, or by saturating lime, dispersed through water, with chlorine.

The neutral chloride, or more simply the chloride, is very soluble; it may, however, be made to crystallize in small prisms. Its solution, left in contact with the air, is gradually decomposed, one part of the lime combines with the carbonic acid of the atmosphere, whilst its chlorine is disengaged. This decomposition of the chloride is retarded by constantly keeping an excess of lime in the solution. From these properties of the chloride, the advantage of manufacturing the sub-chloride only is obvious; its preservation and transport are much more easily effected.

The quantity of chlorine in combination with water, or a base, may be estimated by several processes; but in the arts, in which dispatch is important, the preference has been given to M. Descroizilles' process, founded on the property of chlorine to discolour indigo. One part of indigo dissolved in nine parts of concentrated sulphuric acid, and then diluted with 990 parts of water, forms the coloured liquid usually employed to ascertain the quality of the chlorine.

Under the same circumstances, chloride of lime discolours a quantity of this solution proportionate to its own; but if they vary, the results also are very variable. Thus, if we pour the chloride *slowly* into the indigo, a much smaller quantity of it is necessary to effect the discolouration than if we proceed differently. The minimum of discolouring effect, is obtained by pouring the indigo very slowly into the chloride, and the maximum by pouring the chloride very slowly into the indigo. Repeated trials have proved that the best process for obtaining constant and comparable effects, is to pour the solution of indigo *rapidly* into the solution of chloride, or the latter into the former. I shall explain the mode of operating by and bye.

If the indigo of commerce were pure, or always of the same

quality, the quantity of its solution employed in each assay would give the relative quality of the chloride; but since its quality is very variable, the results of trials made with different indigos cannot be compared together. To avoid these inconveniencies, I have followed the example of M. Welter, and taken as unity of discolouring power that of pure, dry, chlorine, at the barometrical pressure of 0.76 m. (29.92 inches,) and temperature of 0° . (32 Faht.) I prepare a solution of any of the best indigos of commerce of such a strength that the chlorine discolours exactly ten times its volume of it, and I call this solution the *proof tincture*; and each volume of proof tincture that is discoloured I call a *degree*, and I divide the degree into ten parts.

Thus, if we take 10 grammes* of chloride of lime and dissolve it in such a quantity of water as to form one litre of solution, the number of degrees, or volumes of indigo discoloured by one volume of the solution of chloride, will indicate the number of tenths of a litre of chlorine that the solution contains. Consequently, one kilogramme† of chloride of lime, whose quality had been determined by this method, and found to be of 7.6° or $\frac{76}{100}$ ths, would contain 76 litres of chlorine. Each degree therefore is equal to 10 litres, per kilogramme of chloride, and each tenth of a degree to one litre. Supposing the sub-chloride of lime to be perfectly pure, and formed as stated by M. Welter, it contains per kilogramme 101.21 litres of chlorine.

The base I have adopted appears to deserve the preference, from the simplicity and precision of expression that it admits of in chlorometry, which may remain unchanged, whatever means may be used to measure the strength of the chlorine.

We obtain more precision in general with a weak solution of chloride, marking for instance 4 or 5 degrees, than with a very concentrated solution. If, therefore, on the first trial we find that the chloride much exceeds 10° , we must add a known volume of water to the solution, for instance, twice its bulk; we then make a fresh trial, and triple the number of degrees obtained to get the true value of the chloride.

* Or one decagramme, Tr.

† Or 100 decagrammes Tr.

Assay of the Oxide of Manganese.

The purity of the oxides of manganese, employed in preparing the chlorine, is very variable, and consequently that of any particular ore must be ascertained by experiment, which may be easily done in the following manner.

Pure peroxide of manganese is formed of,

Manganese	3.5578 grammes
Oxygen	2.0000
	<hr/>
	5.5578

and furnishes 4.4265 gram. of chlorine, or 1.3963 litre, at the temperature of 0°, and under a pressure of 0.76 m.; consequently 3.980 gram. would produce one litre of chlorine, and one kilogramme would produce 251.23 litres.

We take, therefore, 3.98 gram. of the oxide of manganese which we wish to assay, and treat it with muriatic acid, with a gentle heat, receiving the disengaged chlorine in rather less than a litre of milk and lime; towards the end of the operation we make the acid boil, to drive the chlorine from the vessels into the milk of lime, and add water to make its quantity just one litre. The quality of this chloride will exactly give that of the oxide of manganese.

The value of the manganese does not depend wholly on the quantity of chlorine it is capable of furnishing, but also on that of the muriatic acid required for its production. But the operation is delicate, and the low price of muriatic acid makes it unnecessary. I shall only remark, that the peroxide of manganese often contains the carbonates of lime, barytes, and iron, which saturate to mere loss a portion of the muriatic acid; moreover, as the manganese is not always in the state of peroxide, the quantity of muriatic acid required will not in that case be proportionate to that of the chlorine obtained.

PART II.

Description of the Chlorometer, and of the Method of proceeding in the Assay of the Chloride of Lime.

(See the Plate.)

A small balance, a weight of 5 grammes, and a mortar, contained in M. Gay-Lussac's plate, are omitted, as sufficiently intelligible without engraving.

The mortar is to pulverize the chloride of lime; by this operation we ensure greater accuracy in the assay, as the chloride often contains lumps which dissolve slowly.

D. Jar, with a foot, containing exactly half a litre when filled to the circular line *m*, terminated by two opposite arrows; the surface of the water must coincide with this line, and not its upper edge, which is indicated in the figure by the dotted line.

The jar must be placed on a horizontal table.

E. Stirrer, to stir the solution of the chloride and make it homogeneous: it is to be plunged down into the liquor, and raised up again alternately, without being taken out of it.

F. Small measure, or tube, of $2\frac{1}{2}$ cubic centimetres, which is unvarying for the chlorometer in question; it is intended to measure the solution of chloride of lime. To fill this tube, it is plunged into the chloride to just above the circular line *n*, which terminates its capacity, and the chloride made to rise in it by suction; when filled, the fore finger, which should neither be too dry nor too wet, is placed on the upper orifice, the tube raised out of the liquid, and its lower extremity supported against the margin of the jar, as seen at G, or against the finger. By a little management of the pressure, and a slight alternate circular motion of the stem between the fingers, the liquid descends slowly, and when the lower part of the concave curve which terminates it is in the plane of the little circular line, the stream is immediately stopped by increasing the pressure and the tube emptied into the drinking glass H.*

H. Large drinking glass for mixing the indigo proof tincture

* When the tube becomes opaque, it is cleared by dipping it into muriatic acid, or vinegar.

with the chloride. It should be placed on a sheet of white paper, in order more easily to observe the changes of colour which the indigo undergoes by the action of the chlorine.

I. Tube for measuring the proof tincture: each great division, or degree, is equal to the capacity of the small tube F, and is divided in 5 parts, which is sufficient for practice; but for calculation, the fifths are reduced to tenths. This tube is filled with the proof tincture up to the degree 0, which is easily accomplished, by putting into it rather more tincture than is necessary, and pouring off the excess, drop by drop, by the beak, the extremity of which should be covered by a slight layer of wax or tallow, to assist the running off in drops.

K. Another tube graduated like I, but in a contrary direction. Its use is to hold the proof tincture which is to be poured briskly into the chloride. For conveniently obtaining the desired volume of the tincture, the tube L, drawn out to a point at its lower end, is employed; the excess of tincture is removed by plunging the tube to the necessary depth into it, and closing the upper orifice with the finger before it is withdrawn; in the same manner a deficiency may be supplied from the vessel containing the indigo.

Preparation of the Solution of Indigo, and of the Proof Tincture with that Solution.

“Take a determinate quantity of indigo, sifted through a silk sieve, put it in a matrass with nine times its weight of concentrated sulphuric acid, and heat it in a water bath, at the temperature of boiling water, for six or eight hours. Dilute a part of this solution with such a quantity of water that one volume of chlorine may discharge the colour of exactly ten volumes of the solution: this will be the proof tincture. The simplest, and at the same time sufficiently accurate method of preparing a liquid containing its own volume of chlorine, is to take 3.98 gram. of well crystallized manganese, and treat it with muriatic acid, receiving the chlorine in milk of lime, whose volume is to be reduced to that of one litre after the operation, as mentioned in the assay of the oxides of manganese; but if we wish to operate with the utmost accuracy, the chlorine must be prepared in the state of gas, and absorbed by

water in which a little lime has been infused; the temperature, pressure, and moisture of the gas being noted.

Important Observation.

“ The proof tincture, being gradually discoloured by light, must be carefully kept secluded from it in stone jars; but for the use of the chlorometer it may be preserved in a half litre glass phial, always taking care not to expose it to the direct rays of the sun: it had better be kept in a dark closet.

Process of Assaying the Chloride.

“ Take several specimens from the mass of chloride to be examined, and weigh off 5 grammes, and pound them in the mortar with a sufficient quantity of water to make thin cream; then dilute it with more water, and decant it into the half litre jar. In order not to lose any liquid in this operation, rest the edge of the mortar against the pestle, as seen in the figure D. Triturate the residual chloride remaining in the mortar with water, and decant as before, and repeat these operations till no more is left in the mortar. Rince it out and pour the rinsings into the jar. Make up the volume to exactly half a litre, and stir it to render it perfectly homogenous. Fill the tube I, with proof tincture up to 0° , and pour a portion of it, less than that which you suppose will be discoloured by the chloride, into the glass H, for instance, 5° .

Take one measure of chloride in the small tube E, and make it flow equally into the proof tincture, by blowing into the tube agitating the mixture the whole time. If the tincture be completely discoloured, add quickly from the tube I, such a further quantity as to give the liquid a slightly greenish colour; the quantity of proof tincture taken from the tube I, will be the measure of the quality of the chloride, provided the second portion added be not considerable, nor amount to three-tenths of a degree.

But if the second portion of proof tincture added to the chloride exceed the quantity of three-tenths of a degree; if, for instance, it amount to 1.2° , the assay must be begun again. Fill the tube I

with the tincture, and pour as much of it into the glass H, as is equal to the quantity discoloured in the former experiment, and some hundredths over. Then complete the operation in the manner already described. The assay has not attained the utmost precision it is capable of, till the proof tincture assumes the slightly greenish tint, *immediately* on the chloride being added, without a fresh quantity being required.

By these successive operations we approach as near as we please to the true quality of the chloride; nevertheless, I do not think that we can in general be certain of it beyond $\frac{1}{50}$ th. These operations may perhaps appear complicated, but I must remark, that each of them may be executed in two or three minutes; that when we previously know pretty nearly the quality of the chloride two operations are sufficient, and that in the current labours of a manufactory, one assay will be enough. Moreover, the object is to ascertain the quality of the chloride, in order to fix its commercial value, and in that case we must not be niggard either of our time or our pains.

The same process is directly applicable to the assay of a solution of chlorine in water; but it is better to begin by adding a little powdered quick-lime to the liquid to convert it into chloride.

The tube K, which forms part of the chlorometer, is intended for assaying the chloride, by pouring the indigo quickly into the chloride. For this operation, the quantity of tincture required to saturate one measure of chloride must be previously ascertained by the tube I.

The assay is then begun again by putting into the tube K, a quantity of tincture equal to that which has been discoloured, and a small quantity over, which must be poured quickly into a fresh measure of chloride; as much tincture must then be added as is necessary to give the greenish colour, and the assay once more renewed by putting into the tube a quantity of the tincture equal to that discoloured in the preceding assay. The manipulations in this experiment, are precisely the same as those of the first; but since the results are similar, and it requires the tube K. and L. in addition, I do not consider it as preferable to the former.

" It may be convenient to some of our readers, if we reduce the French weights and measures employed by M. Gay-Lussac, in the preceding very valuable paper to equivalent English ones.

100 cubic inches of pure dry chlorine, at the mean pressure and temperature of 30 inches and 60° Fahr. weigh 75.375 grains, one volume of which discolours 10 volumes of the *proof tincture*.

Suppose we take 250 grains of chloride of lime, and dissolve it in 100 cubic inches of water, and that we find the value of this solution to be denoted by 7.6°, or, in other words, that 1 cubic inch of the solution discolours 7.6 cubic inches of proof tincture; then the whole quantity, or 100 cubic inches of the solution of chloride, would discolour 760 cubic inches of tincture, one-tenth of which, or 76 cubic inches, is the quantity of chlorine it contains.

250 grains = $\frac{1}{28}$ th of a pound avoirdupois; consequently, 1 lb. of chloride of lime of the above quality would afford (28 + 76) = 2128 cubic inches of chlorine, or rather less than $1\frac{1}{4}$ cubic foot, or about 138 cubic feet per cwt.

Assay of the Oxide of Manganese.

Pure peroxide of manganese is composed of

Manganese 28 grains

Oxygen 16

44

and affords 36 grains of chlorine, or 47.76 cubic inches at mean pressure and temperature; consequently 92.127 grains will give 100 cubic inches, and 1 lb. will give 4.397 cubic feet.

We take therefore 92.127 of the oxide to be assayed, and treat it as directed, p. 141, receiving the disengaged chlorine in rather less than 100 cubic inches of milk of lime, which, after the operation, must be made exactly equal to that quantity by pure water and assayed as above. The result will indicate the quality of the oxide of manganese in cubic inches of chlorine per 92.137 grains of ore.

To coincide with these weights and measures, the small weight should be equal to 125 grains: the capacity of the jar G to the

arrows, 50 cubic inches, and that of the little measure or tube F, $\frac{2}{10}$ th of a cubic inch. Each of the large divisions on the tubes I and K, must also be equal to $\frac{2}{10}$ th of a cubic inch, to correspond with the capacity of the small measure F.

To prepare the liquid containing its own volume of chlorine, instead of the 3.98 grammes, &c. we must take 92.127 grains of well chrystalized oxide of manganese, and receive the chlorine in 100 cubic inches of milk of lime; and in the process of assaying the chlorides, we must employ 125 grains of the mixed salts, and decant the solutions into the 50 cubic inch jar D J. G. C."

To render this work as useful as possible, and to prevent any ambiguity respecting the French Weights and Measures, the following tables are subjoined.

English TROY WEIGHT, with the equivalents in French Grammes.

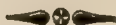
Pound.	Ounces.	Drms.	Scruples.	Grains.	French Grammes.
1	= 12	= 96	= 288	= 5760	= 372,96
	1	= 8	= 24	= 480	= 31,08
		1	= 3	= 60	= 3,885
			1	= 20	= 1,295
				1	= 0,06475

French MEASURES OF CAPACITY, with the equivalents in cubic inches, and English Measures.

		Cubic Inches.		English.
Millilitre	=	,06103		
Centilitre	=	,61028		
Decilitre	=	6,10280	Tons. Hogs. Wine G.	Pints.
Litre	=	61,02800	= 0 0 0,	2,1133
Decalitre	=	610,28000	= 0 0 2,	5,1352
Hectolitre	=	6102,80000	= 0 0- 26,419	
Kilolitre	=	61028,00000	= 1 0 12,19	
Myriolitre	=	610280,00000	= 10 1 58,9	

French MEASURES OF WEIGHT, with the equivalents in English
Grains and in Avoirdupois.

		English Grains.				
Milligramme	=	,0154				
Centigramme	=	,1544				
Decigramme	=	1,5444			<i>Avoirdupois.</i>	
Gramme	=	15,4440		Poun.	Oun.	Dram.
Decagramme	=	154,4402	=	0	0	5,65
Hecatogramme	=	1544,4023	=	0	3	8,5
Kilogramme	=	15444,0234	=	2	3	5
Myriogramme	=	154440,2344	=	22	1	2



INDEX.

A.	PAGE.
Advantages of Disinfecting Process	4, 59
Anatomical Pursuits, Prevention of Putrefaction in	10, 16
Anatomical Preparations ..	23, 24, 25
<i>Alcock</i> , Mr. J. R.....	20
Areometer of <i>Baumé</i>	136
Asphyxia	42, 110, 114, 117
Assay of the Chlorurets or Chlorides.....	137, 142

B	
Bastile, Sewer of the	45
<i>Barruel</i> , M.	41
<i>Baumé's</i> Areometer.....	136
(See also the plate.)	
<i>Bell</i> , the late Mr. John	75
Bladder, Diseases of	103
Bleaching Powder	132
<i>Boisbertrand</i> , M. de	xii
<i>Bouley</i> , M. jun.	84, 122
Boyaudier, l'Art du	31
<i>Bourcier</i>	8
<i>Bracconnot</i> , M.	25
<i>Burdin</i> , M.	116
Burns and Scalds	108
<i>Byron</i> , Lord	5

C.	
<i>Cadet de Vaux</i> , M.	41
<i>Carlisle</i> , Sir Anthony	iii

	PAGE
Carbonic Acid Gas, precautions..	52
Cancer	109
<i>Caventou</i> , M.	117
Charcoal, Fumes of	115
<i>Chantourelle</i> , Dr.	110, 115
Chlorates	iv
Chlorurets (see table of contents)	iv
Chlorides	iv
Chlorurets compared with other Disinfectants ...	xi, 54, 61, 62, 117
Chronic Ulcers	97
Certificate relating to Robert's Hood	51
<i>Chanas</i> , M.	124
Chlorometer, 136 (see also the plate)	142
Clergymen	57
<i>Cloquet</i> , M. Jules.....	82
<i>Children</i> , Mr.	139
Contents, Table of	i
Commission appointed to examine the Chlorurets	vii
Communications solicited	xvi
<i>Cocks</i> , Mr.....	24
Compound Fracture ..	71, 99
Corpses, prevention of Putrefaction before Interment	4
<i>Cullerier</i> , M.....	87

D.	
Dangers of visiting the Sick prevented.....	57
<i>Dalton</i> , Mr.	138

	PAGE.
<i>Darcet, M.</i>	31, 49
<i>Dard, M.</i>	125
Documents, official, see <i>Introduction</i>	
Disinfectants, see <i>table of contents</i> .	
Disinterment of Corpses for Judicial	
Examination	5
Disinfection of Hospitals, Sick-	
Rooms, &c. (see <i>table of con-</i>	
<i>tents</i>)	27
Disinfection of Ships	29
———— of Putrid Water	29
———— of Workshops	30
Dissection, Wounds received in	112
Disease, prevention of	53
Diseases of the Bladder, &c.	103
———— of the Joints, with Ulcers	113
<i>Dupuytren, M.</i>	41
Duties of the Surgeon	68, 71

E.

<i>Elliotson, Dr.</i>	107
Embalming.....	23
Emptying drains, &c.	39
Exhumation, remarkable instance	
of	6
Experiments, remarkable	33, 45
Experiments proposed	xv
Essentials in the treatment of Dis-	
ease	73
<i>Estienne, Dr.</i>	55

F.

<i>Farraday, Mr.</i>	54
<i>Ferrus, M.</i>	116
Fever, Use of the Chlorurets in	56
<i>Filkin, Dr.</i>	7, 8, 114
Fistulæ, vesical urinary	105
Formulæ for the Preparation of the	
Chlorurets	126, 129, 135
Fracture, Compound.....	71, 99
French Weights and Measures..	147
Furnace of Darcet	49

G.

	PAGE.
Gangrene, Hospital.....	73, 81
————, from bursting of the	
Urethra	83
————, of the Face	91
<i>Gay-Lussac, M.</i>	136
<i>Gerdy, M.</i>	6
<i>Gesnoul, M.</i>	3
<i>Girard, M.</i>	89, 125
Gonorrhoea	112
<i>Grosse (or Gorse), Dr.</i>	85
Gums, Ulcerations of the	109
<i>Guyton-Morveau, M.</i>	27, 33, 55

H.

Hayti, Disinfections at.....	25
<i>Hallé, M.</i>	41
<i>Hennelle, M.</i>	6
<i>Henry, Dr.</i>	138
Herpes	109
Hospital Gangrene.....	73, 81, 92
Hospital Gangrene, instances in	
private life	79, 89
<i>Husson, M.</i>	116

I.

Introduction, containing historical	
outline.....	iii
<i>Idt, M.</i>	3
Inconveniences, Parisian	37
Injection of Blood Vessels	17
Infiltration of Urine	83, 84
Improvements suggested	13, 101
Indigo, Solution of, a test for the	
Chlorurets	143
Inflammations of Mucuous-Mem-	
branes	111
Internal use of the Chloruret of	
Soda	119

J.

Joints, Diseases of	113
---------------------------	-----

L.	PAGE.	Ozæna	112
LABARRAQUE, M. Page iii, 1, <i>et passim</i> .		Ophthalmia	112
Lagneau, Dr.	109	P.	
Legs, Ulcers of	95	Parent Duchatelet, M.	41
Lemaire, M.	90	Parents, Occasional cause of	
Laurens, M.	52, 114	anxiety to	58
Lazaretto of Marseilles	56	Pariset, Dr.	27
Lesueur	6	Pathological Investigations	21
Lisfranc, M. Page iii, 53, <i>et passim</i>	92	Paulin, M.	40
LOUIS xviii.	x, 5	Payen, M.	31, 63, 138
Lying in state, Lord Byron, LOUIS xviii.	5	Perfume, The best	65
		Pelletier, M.	31
		Penitentiary	54
M.		Phagedenic ulcers	81, 92
Maingault, M.	89	Plague, precautions respecting ..	59
Marc, Dr.	29, 116	Plan of this Essay	xv
Manganese, assay of	141	Plazanet, Baron de	51
Marjolin, Professor	82	Preparation of the Chloruret of	
Manufacture of gut strings	31, 32	Oxide of Sodium	126, 134
Measles	58, 111	———— of the Chloruret of Lime	129
Merimée, M.	31	Precautions before descending into	
Medical Men	28, 57	Wells, &c.	52
Midwifery, Uses of the Chlorurets		Precautions required in combina-	
in	107	tion with the disinfecting pro-	
Miner's Hood, its use in entering		cess	28, 64
sewers, &c.	45	Precautions in approaching the	
Millan, M.	31	Sick	24
Mirambeau, M.	26	Preservation of parts for Private	
Mortification	91	Anatomical Studies	18, 24
Mode of using the Disinfectants 4, 9,		Prevention of Putrefaction—See	
15, 19, 22, 23, 27, 29, 32, 34, 36,		Contents	
38, 40, 44, 60, 65, 102.		Prevention of Diseases	35
N.		Prevention of offensive effluvia ..	38
Nomenclature relating to the Chlorurets	iv.	Principles for the Assay of the	
Nuisances	30, 37	Chlorurets	157
O.		Privies, disinfection of	36
Ollier, Mr.	91	Price, Mr. Frederick	88
Orfila, Professor	6, 116	Poisoning, remarkable instance of	8
		Poisoning counteracted	110, 114
		Ptyalism	110
		Putrid Sore Throat	110
		Purification of putrid water	29

R.	PAGE	PAGE.
Rewards granted to M. Labarraque	vii. ix. xiii. xiv.	
<i>Rey</i> , Dr.	85	
Rest, in treatment of Ulcers	96	
<i>Reynard</i> , M.	110	
<i>Roe</i> , Dr. G. H.	iii. 111	
<i>Robert</i> , Dr.	xiv. 57	
<i>Roberts</i> , Mr. John, Inventor of the Miner's Hood ...	45	
Royal Institute of France	ix.	
S.		
<i>Sanson</i> , M.	107	
Salivation	110	
Scarlet fever	111	
Schools, Prevention of Contagion in	58	
Security*afforded	59	
Scalds.....	108	
Scald-head	109	
<i>Ségalas</i> , Dr.....	82, 105	
Sewers, dangers of entering, ..	40, 45	
——, precautions pointed out..	52	
Simplification of Apparatus ...	131	
Small Pox.....	58, 111	
Society for the Encouragement of National Industry	vi	
Society, Academic, of Marseilles	xiii	
Surgeon, duties of the	68	
Surgery, Veterinary ...	122	
Stables, purification of	43	
Syphilitic ulcers	81	
Sulphurets of Potash and Soda, poisonous effects of	114	
T.		
<i>Tennant</i> , Mr.	132	
		PAGE.
Tests, for ascertaining the quality of the Chlorurets ..	128, <i>et seq.</i>	137
<i>Thenard</i> , M.	41	
Throat, ulcers of.....	110, 111	
Treatment of disease, value of the Chlorurets in.....	66	
Tropical Climates, value of Disin- fectants in	25	
Typhus, prevention of	56	
U.		
Ulcers, 75.—of the Mouth, 109. —sinuous	113	
Ulcers, phagedenic	92	
Ulcers, chronic and ill-conditioned, particularly of the legs	95	
Urine, Disinfection of	36	
Urinary Organs, diseases of	103	
Use of the Chlorurets in the Arts iv, 30		
Uterus, diseases of	106	
V.		
Value of Disinfectants	53, 57	
Vapours, Mephitic, ill effects of	37	
<i>Vaux</i> , M. Cadet de	41	
<i>Virey</i> , M.	55	
Ventilation, its Importance 11, 13, 64		
Venereal Ulcers	81, 85	
Verminous ulcers	75	
Veterinary Surgery, use of the Chlorurets in ...	122	
W.		
Water, Purification of	29	
Want of care, results of	74	
Weights and Measures,	147	
Wells, precautions relating to ..	52	
<i>White</i> , Mr.	iii	
What the Chlorurets cannot effect	72	

FINIS.



Fig. 1



Fig. 4

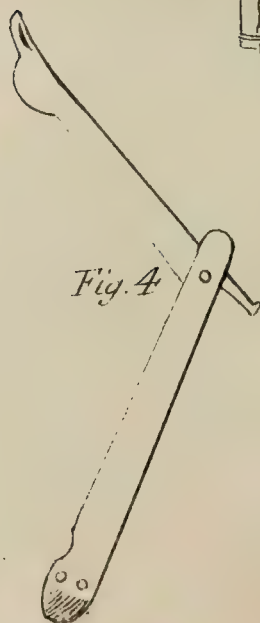


Fig. 3

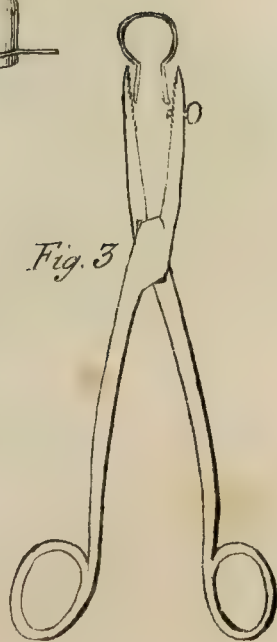


Fig. 6



Fig. 2

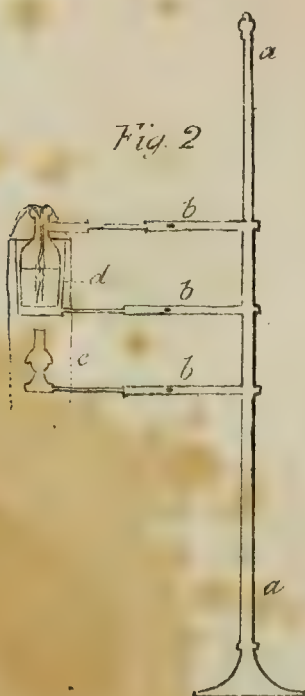


Fig. 5



A
PHYSIOLOGICAL ENQUIRY
RESPECTING THE ACTION OF
MOXA,
AND ITS UTILITY IN
INVETERATE CASES
OF
SCIATICA, LUMBAGO, PARAPLEGIA, EPILEPSY,
AND SOME OTHER
PAINFUL, PARALYTIC, AND SPASMODIC DISEASES
OF THE
NERVES AND MUSCLES.

BY WILLIAM WALLACE, M.R.I.A.
&c. &c.

SURGEON TO THE CHARITABLE INFIRMARY OF DUBLIN, AND TO THE INFIRMARY
FOR THE TREATMENT OF RHEUMATISM AND CUTANEOUS
DISEASES IN THAT CITY,
LECTURER ON SEMEIOLOGY AND CLINICAL SURGERY:

DUBLIN:
HODGES AND M'ARTHUR, AND W. CURRY, & CO.;
LONGMAN, REES, ORME, BROWN, & GREEN, LONDON;
M'LACHLAN AND STEWART, EDINBURGH.

1827.

“ Fallax non raro Experientia, si Rationis ductû fuerit destituta : Quapropter, nisi mutuam sibi lucem communicent, æquam erroris ansam præbebunt.”

BAGLIVI OPERA, CAP. II. SEC. 5.

P R E F A C E.

WHEN, at the request of some professional friends, I first determined to communicate the results of my employment of Moxa, it was my intention to limit the publication to those general observations, which form the preliminary matter of the present work, and to the recital of a select number of cases. This, I hoped, would contribute sufficiently to the removal of the prejudices which exist in these countries against the use of Moxa, and assist in placing this valuable remedy in that high rank, which it so eminently deserves among the most important therapeutic agents we possess.

A little reflection, however, soon convinced me that such a mode of proceeding was ill-calculated to do justice to my subject. For, from numerous conversations, which I have intentionally held with my professional brethren, I feel certain, that one of the great barriers to the employment of Moxa, in Great Britain, arises from its mode of action being compared and confounded with that of other remedies

in general use. It appears, in fact, to be inferred from such views, that Moxa does not afford any peculiar means of combating disease; and, therefore, that there is not any good reason why it should be employed, when its effects might be procured by other remedies, which are not so likely to excite the fears or apprehensions of the patient.

Thus, it appeared absolutely necessary to the success of my endeavours to demonstrate, *in limine*, that the prevailing opinions, respecting the mode of action of Moxa, are completely erroneous; and to show that this agent affords a remedy which cannot be replaced by any other yet known. This demonstration I have attempted to furnish in the first and second sections of the work, in which I consider the immediate cause of functional disease, and the mode of action of Moxa. I have thereby been led to trace the general principles, which should regulate us in combating morbid action; and also to investigate the particular agency of Moxa, as a mean of fulfilling some of those numerous indications, which the varied forms of disease present.

The eagerness, which the novelty of a new remedy excites, frequently prompts us to a very unscientific application of it. For, on such occasions, we often pay little attention to the stage of disease to which its peculiar action may be suited, or to those numerous collateral indications, which must be fulfilled to secure its beneficial influence. That it

would be otherwise with the Moxa, I could not expect, if I contented myself merely with the general assertion, that it was suited, by the nature of its mode of action, to a particular class of morbid affections. To secure its judicious application I have, therefore, investigated, in the third and fifth sections, the exact stage of disease, in which it should be employed, and the various adjuvants which may be used along with it. Thus, the work has gradually, and I may add, necessarily assumed, in some measure, the aspect of a dissertation on the general treatment of one stage of an important class of diseases, and of a physiological investigation of the general action of Moxa on the vital textures.

In selecting cases to illustrate my views, I have been much influenced by a desire to furnish such as afforded proofs of the efficacy of Moxa, which I considered unequivocal, because other measures had been previously employed in vain in these cases, and because the treatment adopted by me, was conducted without the material co-operation of any other remedy. The reader will recollect this circumstance, for, as the cases have been selected from a vast number, he must not expect that, in the common course of practice, he will meet with a succession of patients, whose diseases will present indications so simple, or require such little modification in treatment. At the same time, as all the cases related happened

within the space of a very few weeks, he will conclude that, when the field for observation is extensive, such cases will be found of frequent occurrence.

It is likely that it shall be asked by some of my readers, why have I not spoken respecting the use of Moxa in many other diseases, for the cure or relief of which it is extolled on the Continent? If so, I beg leave to observe, that I have intentionally limited myself to those diseases in which I could speak of its influence with decision, from having had, in my own practice, the most ample opportunity of employing it, under almost every possible circumstance.

Nor can it be considered irrelevant to state, that I am entitled to speak with confidence respecting the diseases treated of in this publication, from having enjoyed a field for observing them, greater than commonly falls to the lot of hospital Surgeons. This has arisen from my connection, for eight years and upwards, with the Dublin Skin Infirmary, and from some share of private practice in these diseases, resulting from that connection. For, although the Infirmary was founded for the treatment of rheumatic and cutaneous diseases alone, it has become a point of attraction not only to those patients who labour under the diseases for which it was instituted, but for all those affected by disorders which appear, in the eyes of the public, to be allied to them, or

which may be benefited by the highly valuable and efficacious apparatus which has been constructed at the Infirmary.

It has been warmly discussed, whether the cause of medical science be advanced or retarded by establishments for the treatment of particular diseases: but, although much has been ingeniously said against such institutions, upon the grounds of their tendency to lead the mind to view certain diseases in too abstract a manner, while all maladies should be considered as the members of one family, each class mutually illustrating the other—I am quite convinced, that they must inevitably lead to improvements in both science and practice, if they be held by individuals connected with general hospitals, and who are thus prevented from forming those narrow and hypothetical views, which certainly might otherwise arise. For, it is evident, that if a number of diseases of a similar kind are grouped together, an opportunity is afforded of comparing their different forms, which cannot be had under other circumstances; and, from this comparison, great practical advantage, in the way of diagnosis and treatment, must necessarily result. Moreover, when an institution is limited in its object, the arrangements for the peculiar and accurate treatment of those diseases, which come within its scope, may be made much more complete than in a general hospital.

In consequence of the great variety of very

different cases, in which I have had occasion to employ Moxa, I have been led to make several modifications in its mode of application. Of these I have given some account in the fourth section. I have also taken an opportunity of describing a mode of cupping, which is very superior to that in general use in these countries. Lastly, I have given a drawing of such instruments referred to in the following pages, as have not been already delineated in my other publications. Among these, the reader will find a sketch of the scarificator used by Baron Larrey in the operation of cupping. This last drawing was made from an instrument, with which I was presented by the Baron, on the occasion of his late visit to Dublin.

INTRODUCTORY OBSERVATIONS.

“ Non vereor, nequid timidè, nequid stultè facias, si ea defendes,
Quæ ipse recta esse senties.”

CIC. EP. ad FAM. LIB. 2, EP. 7.

OF the numerous and important peculiarities which distinguish French from British Surgery, there are none more remarkable than those afforded by the remedy which holds a prominent rank in the following pages. — That striking differences should have existed in the surgical practice of Great Britain and France, so long as scientific intercourse between these countries was obstructed by warfare, might be expected, however deplored, as one of the inevitable misfortunes of that state; but that these differences should continue for a number of years, after every obstruction to scientific intercourse had ceased, will not, in the eyes of the philanthropist, exalt the professional character in either country; and it is impossible to avoid concluding that, either at *home* or *abroad*, there must exist a culpable neglect of comparing national peculiarities, and of deriving from that comparison legitimate conclusions for the regulation and improvement of practice; or, the existence of a national prejudice must be admitted, all-powerful in opposing whatever may be of foreign growth.

There are but few who will dispute that human nature is much the same at all times, and in every country; and, although I should be sorry to suppose, as it has been asserted, that "the national pride or prejudice of the English, is greater than that of any other civilized nation," I would be affording in myself a proof of those failings, if I were to assert, that we are not influenced by them as much as our neighbours. It is, therefore, most rational to suppose, that, when great differences exist in the surgical practice of Great Britain and France, truth may lie between the extremes.

Such were the reflections which induced me, some years ago, to investigate the powers of a remedy which had obtained the highest character on the Continent, without awakening attention in these countries; and having ascertained, by careful and extensive observation, both in hospital and private practice, that it afforded a valuable addition to our means of treating Rheumatic and Cutaneous diseases, I solicited the attention of my professional brethren to the subject; and have now the satisfaction to reflect, that my experience has been confirmed and testified by numerous communications from practitioners of the first respectability in different parts of the United Kingdom.* Motives, precisely similar, prompted me to the employment of the remedy which forms the subject of the following pages; and having found it deserving of the high character which it enjoys on the Continent, I have felt that I would be deficient in zeal for the advancement of my profession, if I did not exert my humble efforts to awaken attention to the subject, and contribute my mite to the

* See "Observations on Sulphureous Fumigations, as a Powerful Remedy in Rheumatism and Diseases of the Skin." by W. WALLACE, M. R. I. A. &c. Dublin.—1820.

removal of any prejudices which may exist against its employment.

It is impossible, in my opinion, for any individual in search of truth, and anxious to extend his professional resources, to peruse the writings of Baron Larrey, without forming the highest opinion of the efficacy of Moxa in the treatment of some of the most obstinate diseases to which we are subject.* It must be obvious, that a man who has held, for a long series of years, the highest and most responsible situation in his profession, would be incapable of any kind of wilful misrepresentation. It is equally evident that his almost unparalleled experience, is a sufficient guarantee that he has not himself been deceived in the opinion which he has formed of its efficacy. Can the strong terms in which he has extolled this remedy be attributed to any other cause than a sincere desire to benefit mankind? No love of fame could induce such a man to deceive his professional brethren, for he enjoys already all that fame can give; no desire of emolument could prompt him to such base conduct, for his peculiar situation removes him from all possible suspicion of this kind. Nor should it be forgotten, in estimating the degree of importance to be attached to the writings of Larrey on the subject of Moxa, that it is not a remedy which has originated with him; for he candidly informs us, that during his campaigns in *North America*, *Egypt*, and *Syria*, having had an opportunity of confirming the observations of authors and travellers, respecting the great advantages which the people of those countries derive

* The MOXA may be defined, any substance whose gradual combustion is allowed to take place on the skin, for the cure or relief of disease.—A word probably of ARABIC origin, from *Muhk*, being scorched—or of PORTUGUESE extraction from *Motzhia*, match.

from the use of Moxa, in several intractable morbid affections, he availed himself of every occasion which occurred in his practice of making trial of it; and the happy and extraordinary success, which he generally obtained from its application, in a great number of desperate cases, induced him to publish the result of his practice; “*trop heureux,*” says he, in that zealous and benevolent spirit which has uniformly marked his professional career, “*trop heureux si cette nouvelle production peut contribuer aux progrès de la chirurgie, et me donner un titre de plus à l’estime publique!*”

Nor is the value of this remedy supported by the testimony of Larrey alone. The scarcely less illustrious Baron Percy, Inspector General of the medical staff of the French armies;—Dupuytren, whose professional fame has long since extended over Europe;—his venerable colleague, Pelletan, chief surgeon of L’Hotel Dieu;—the well-known, and deservedly eminent, Riche-rand;—Roux, the experienced surgeon of La Charité;—in short, every practitioner of extensive experience in France, every hospital surgeon, every professor of the School of Medicine of Paris, with one voice style it “*le remède souverain!*” “*le remède héroïque!*”

Are we to suppose that these illustrious men are all deceived, or that they are all wilful impostors on public credulity? Surely no rational mind can come to such a conclusion! Why, therefore, is not the Moxa in general employment among us? I am afraid this cannot be attributed to any other cause, than to some dislike of deviating from accustomed routine, or to some deep-rooted prejudice,—or to what is even worse, a deficiency of that spirit which should be always alive in the bosom of every man of science, of every profession, to avail himself of every light in the particular pursuit to

which he has devoted his attention—a spirit which ought to be peculiarly alive in the medical practitioner, whose immediate profession is so intimately connected with the alleviation of the sufferings of mankind. He ought to be most anxious to catch at any means which will increase his powers of removing or alleviating disease; particularly if they offer a fair prospect of success in the treatment of those maladies, which are little under the controul of ordinary measures.

Will any one reply, as I have heard asserted in conversation, that the Moxa has been tried in these countries, and that it has not fulfilled the expectations raised by the Continental practitioners? If so, the following is my answer, that as far as I have heard of its employment in these countries, it has been used either upon no fixed principle at all, or upon an erroneous one: cases have been selected for its application, without any scientific ground of choice; and in no one instance have I heard of its proper employment having been persevered in, so as to afford any rational hope of benefit. In these assertions, I am fully supported by the testimony of Dr. Dunglison, formerly of London, and now a Professor in the School of Medicine of Virginia. The following are his words, in a learned Introduction to his Translation of a Memoir on Moxa, by Baron Larrey, p. lxiii.—“The observations of British practitioners can have no weight, however, upon this subject; for the Moxa, most assuredly, *has never had even the shadow of a fair trial in this country*: some few cases have occurred where it has been employed, but they have been so rare, and so imperfectly followed up, that no negative or affirmative respecting its good effects can be deduced from them.”

But, while I have found some ready to assert that the

utility of Moxa was not equal to the success which might have been expected, I have found none who were hardy enough to affirm, that it was an inefficient remedy, or that it was never useful. And are we, because we cannot obtain from it, on all occasions, those remarkable cures, which appear to have resulted from the employment of it by those who have advocated its cause, are we, I say, on such an account, to exclude it entirely from practice?—Such conduct might be compared to that of a sculptor of ordinary talent, who would discard the tools used by a Canova or a Therwolsden, if he was not able, like their illustrious owners, to make his object start into life under their magic influence.—Or take the matter in another point of view, and for argument's sake let it be admitted, that the advocates of this remedy have been too partial in their recommendations, are we to go into an opposite extreme, and because we cannot obtain every advantage from it, obtain none? May not such conduct be compared to that of those sceptics who have abandoned the employment of vaccination, merely in consequence of its not fulfilling every thing which Dr. Jenner promised on its first introduction. Legitimate scepticism is our natural protector against the evils of imposition and credulity, but, like all other faculties of the human mind, it is made the subject of daily abuse. There are many who cherish this spirit, from a false idea that it denotes the exercise of a superior intellect; to such let me observe, in the words of that distinguished philosopher Dugald Stewart, that “Unlimited scepticism is as much the child of imbecility as implicit credulity.”

There is, certainly, no greater barrier to the advancement of medical science, than the exaggerated recommendation or indiscriminate application of remedies.—Our most valuable resources require the most judgment

in their employment; and the very circumstance, that a remedy is of great and general power, becomes, extraordinary as it may appear, often the cause of its falling into total disuse. For when a remedy possesses remarkable activity, the ignorant and thoughtless practitioner often adopts it as his sheet anchor, and not having judgment or caution sufficient to distinguish the cases to which it is suited, from his indiscriminate employment of it there necessarily results frequent failure or accident; for in general, exactly in the same proportion as a remedy is efficient in removing disease, so is it deleterious to the system, if improperly applied. And, it is scarcely necessary to say, that if from such misapplications any serious consequence should arise in the practice of an individual, whom fashion has made high in rank, it may become the cause of its total removal from general practice or employment. "*Marcus dixit?*" and the crowd exclaims "*ita est*"—

"Did Marcus say 'twas fact?—then fact it is,
No proof so valid as a word of his."

Public clamour thus once raised against it, custom comes to the aid of prejudice, and affords if possible, a more powerful barrier to truth than even the undue influence of authority, for, as Dr. Paley observes, "The mass of mankind act more from habit than reflection." Thus, there exists a fashion in medicine, as in the other affairs of life, regulated by the caprice and supported by the authority of a few leading practitioners, which has been frequently the occasion of dismissing from practice valuable medicines, and of substituting others less certain in their effects, and more questionable in their nature.

When a remedy has been thus banished from gene-

ral employment, it falls into total disuse, and remains in oblivion, until some other circumstances again call it into action. Unfortunately the history of the *Materia Medica* affords but too many proofs of the truth of this assertion. As Dr. Paris observes, in his *Pharmacologia*, the warm bath, which for so many ages was esteemed the greatest luxury in health, and the most efficacious remedy in disease, fell into total disrepute in the reign of Augustus, for no other reason than because Antonius Musa had cured the Emperor of a dangerous malady by the use of the cold bath. The most frigid water, which could be procured, was in consequence recommended on every occasion. This practice, however, was doomed to but an ephemeral popularity; for although it had restored the Emperor to health, it shortly after killed his nephew and son-in-law Marcellus; an event which at once deprived the remedy of its credit, and the physician of his popularity.

The Peruvian Bark having unfortunately failed, in the autumn of 1652, to cure Leopold, Archduke of Austria, of a Quartan Intermittent, the disappointment kindled the resentment of the Prince's physician Chifletius, who published a violent philippic against its virtues, and this so fomented the prejudices against its employment, that this powerful remedy had in consequence nearly fallen into total disrepute. Nor has Antimony (one of the most powerful remedies, and without which an efficient practice of medicine could scarcely exist,) escaped the vicissitudes of public and professional favour. In the celebrated contest, which took place between the Galenical and Chemical sects, and which has given such a controversial tone to the writers of the 15th and 16th centuries, the Galenists, (who occupied the schools, and who consequently had

the ear of Government,) conceiving that the revolt from orthodox authority was, in a great degree, attributable to the introduction of antimonial remedies, careless of the advantage which these remedies afforded in the treatment of disease, and ready to forfeit the welfare of their species for the support of their cause,—denounced the preparations of this metal with all the virulence of party spirit; and the more effectually to support their ground, and to oppose and persecute their adversaries, they solicited and obtained the aid of secular power. The Parliament of France accordingly proscribed the use of Antimony, by an edict in 1566; and Besnier was expelled the Faculty of Medicine of Paris, in 1609, for having administered it to a patient!! After a time, from some new influence, Antimonial Wine was, by public authority, received into the number of purgatives; and in 1650 a new decree rescinded that of 1566, restoring all the preparations of Antimony to public favour and general reputation. And, extraordinary as it may appear, the very same Government, which had with such great virulence, and so little justice, persecuted every practitioner, who had shown any predilection for the use of this mineral, actually purchased, in the year 1720, the secret of an antimonial preparation, called *Panacea Glauberiana*, from a Surgeon of the name of La Legerie, who had acquired the secret from a pupil of Glauber.*

But we need not look beyond the present time for a proof of those vicissitudes which our most valuable remedies undergo.—Have we not a remarkable example of this in the existing state of practice respecting syphilitic diseases? By the highly valuable investi-

* See *Pharmacologia*, by J. A. Paris, M. D. &c.

gations of British Army Surgeons, the possibility of curing these maladies, without mercury, was fully ascertained. The discovery naturally led, as it should have done, reflecting practitioners to employ a much smaller quantity of this mineral, and from this change in practice considerable advantages have resulted to mankind; but these advantages have been deeply chequered, in consequence of the line of practice adopted by those who conclude that mercurials must rarely, if ever, be employed. Such a conclusion appears not only logically incorrect, but really absurd, when it is considered that, if we possess any specific, mercury is a specific for syphilis, when properly administered; and although this disease may often, if not always, be cured without mercury, its cure is, with few exceptions, far more rapid, more certain, and more satisfactory, under the mild and well-directed management of this mineral. Thus it has, in every age, uniformly happened that we are eternally vacillating between extremes. Do those who cry out against the mercurial treatment of syphilitic diseases, upon the principle, that they are capable of being cured without mercury, reflect that the same reasoning would apply to the exclusion of three-fourths of our remedies, in the greater proportion of the diseases to which the human race is subject? And would any one be so weak as to argue, that because these diseases can be cured without a particular system of treatment, we should refrain from that treatment, (when it can be employed without risk or danger,) and thus consign our patients to weeks, yea months, of a valetudinary state of health, when his complaints might have been removed in as many days? Let common sense and humanity, therefore, combine, and drive this "*Médecine expectante*," or, as it has been properly styled, "*Meditation on death*,"

to its deserved oblivion; and while we avoid the excessive salivations which occurred in the practice of our forefathers, let us not prolong the miseries of our patients by adopting an opposite extreme; otherwise our profession shall soon deserve the definition which has been given of it by a foreign writer—"Physic is the art of amusing the patient, while nature cures the disease."

Such are a few examples of the remarkable vicissitudes which our most valuable remedies have undergone. The history of Colchicum, Cubebs, Opium, Henbane, Tobacco, Iron, &c. &c. would furnish many more. Occurrences like these constitute the real opprobria of medical practitioners. They afford degrading materials for a history of the human mind, and have deservedly brought on *us*, but undeservedly on *our profession*, the keen shafts of ridicule.

But, to return to my subject, from which I have been insensibly drawn, I could adduce many facts in proof of the sad misapplication of the Moxa; let the following serve as an example. A poor woman, who some short time before had met with a fall, applied to a surgeon to relieve her arm, which hung powerless at her side. The surgeon prescribed the Moxa.—It was applied.—I shall say nothing of the manner.—No relief from the application.—It was repeated.—Still no relief.—This treatment was pursued until the Moxa had been applied four times. What will the reader suppose now occurred? Why, the Moxa was of course denounced as a useless remedy in paralysis of the shoulder from injury; and, the patient having fallen into other hands, it was ascertained that the cause of this want of power, which could not be removed by the application of the Moxa, was owing to a fracture of the humerus near its neck!!! Such oc-

currences can scarcely be attributed to ignorance, they must arise from want of attention ; if, therefore, sufficient attention is not given to distinguish such obvious cases, and if the remedy is consequently misapplied in them, how much more likely will it be for such misapplications to take place in cases, which require all the discriminating judgment of the most accurate and most skilful practitioner.

Another great source of error arises from the incorrect views which prevail respecting the action of Moxa. I have uniformly heard its effects compared to those of a blister or issue. Nothing can be more unfounded than such an opinion. Of this the reader will be convinced hereafter. In the mean time, it may be observed, that the good effects of a blister are attributable, partly to the local inflammation or counter-irritation excited by it, and partly to the serous or purulent discharge which results : while the action of an issue depends on the purulent drain which it causes. Whereas, the Moxa, when properly applied, and in appropriate cases, may be said to produce neither inflammation nor discharge. In fact, if it should excite much inflammation, it must be quite certain that the Moxa is either not suited to the case, or that it has been incorrectly applied ; and, on many occasions, no discharge whatever results. But, even when a discharge does take place, the good effects of the Moxa have occurred, long before the discharge has been established ; and, although the discharge may be useful in some particular cases, its beneficial effects depend upon a principle altogether different from that which explains the utility of Moxa. This remedy, therefore, does not act either as a blister or issue ; and it will be proved in the sequel, that the practitioner, who shall regulate his conduct as if he expected such effects, must inevitably fail, in obtaining the beneficial

influence of Moxa, in nine cases out of ten in which he may employ it.

Some, from what motives I cannot conceive, have attempted to excite a popular prejudice against the application of Moxa, by representing that it is a remedy of a most painful nature. Others have wished to cast a degree of ridicule and barbarism on the practice, by comparing it with the application of the actual Cautery, "which," say they, "is confined to English farriery." Do such objections deserve a serious refutation? To compare Moxa with the actual Cautery, is indeed "*parvis componere magna.*" It is true that caloric is the active agent in both applications; but, do we not amputate the female breast, incise the urinary bladder for the extraction of a stone, and remove an insignificant wen with the same instrument; and will any one, because the same agent is used on these very different occasions, compare the danger, severity or delicacy of the former operations with those of the latter. Just as well might the application of the Moxa be compared with that of the actual Cautery.

Did the pain, which attends the application of Moxa, afford grounds for its exclusion from practice, we should also exclude the majority of surgical remedies. This is, unfortunately, one of the objections to the employment of those resources which our art affords. In estimating the degree of pain which attends the application of any remedy, we should compare it with the evils which the remedy is meant to relieve. If the pain, which is excited by the Moxa, be considered in this point of view, fewer objections can be offered to it than to many other remedies in daily use; for, while I know of none whose efficacy can be compared to it in many diseases, there are several which are much more painful. I have had innumerable opportunities of ascertaining the opinions of

patients, respecting the comparative pain produced by Moxa, caustic issues, and blisters; and, *I have never met with a single instance, in which the Moxa when properly applied, has not been considered the mildest remedy by many degrees.* I admit that there is nothing more natural than to suppose its application must be attended by very considerable pain. This is, however, far from being the case. Instances have occurred to me of the youngest patients urging its repetition, so trifling was the uneasiness which it produced, compared with the distress which it relieved.

Sir W. Temple applied the Moxa in his own person, and what is the account which he has given of it? In the following words he describes his sensations during its application: "For the pain of the burning itself, the first time it is sharp, so that a man may be allowed to complain: I resolved I would not, but that I would count to a certain number, as the best measure how long it lasted: I told *six score and four as fast as I could*, and when the fire of the Moxa was out, *all pain of burning was over.* The second time was not near so sharp as the first, and the third a great deal less than the second. The wound was not raw as I expected, but looked only scorched and black; and *I had rather endure the whole trouble of the operation than half a quarter of an hour's pain, in the degree I felt it the first whole night.*"* This fully corresponds with the following remark made by Kæmpfer in his History of Japan. "The pain is not very considerable, and falls *far short of that which is occasioned by other caustics or actual cauteries.* I have seen many times the very boys suffer themselves to be burnt in several parts of their

* Letters written by SIR WILLIAM TEMPLE, Bart. and other Ministers of State, &c. Published by JONATHAN SWIFT, Domestic Chaplain to his Excellency the Earl of BERKELY, &c. page 135. vol. 1. Lond. 1720.

body, without shewing the least sense of pain.”* To these testimonies, in support of my own observation, many others might be adduced ; but I limit myself to the above, because they are the testimonies of men, who did not belong to our profession, and because they must consequently be received as entirely impartial.

Having, I trust, prepared the reader for an unprejudiced investigation of the facts and conclusions, which are to follow, I shall proceed to my immediate object ; and as it is quite clear that we cannot make a scientific application of any remedy, without an accurate acquaintance with the nature or immediate cause of those morbid states, which it is meant to cure or relieve ; some reflections on this subject will, therefore, with propriety first occupy our attention.

* *History of Japan.* vol. ii. sec. 4. page 39.

SECTION I.

OF THE IMMEDIATE CAUSE OF FUNCTIONAL DISEASE.

“ We ought carefully to distinguish between a true physical cause, and those which may be termed metaphysical ; a knowledge of the former constitutes real science, and conducts to useful practice ; to rest satisfied with the latter, is to be contented with empty figments, and barren speculation.”

PRINCIPLES OF SURGERY, by J. PEARSON, F.R.S. &c.—p. 21.

WE frequently read in medical writings, and hear in professional conversation, the term *functional* disease, in contradistinction to the term *organic* disease. A little consideration will prove the incorrectness of such language, and lead to the inevitable conclusion that all diseases are both *functional* and *organic* : or in other words, that there is no functional disease without organic derangement ; nor any organic disease without functional disorder. If the mode of expression alluded to, did not lead to error in reasoning on the treatment of the diseases, which form the subject of this publication, I should not stop to notice it ; but, conceiving as I do that it has a powerful, though, perhaps, insensible influence on our mind in actual practice, I feel it necessary to say a few words on the subject.

Every texture or organ, which enters into the formation of a living body, performs at least two functions : one of

these functions relates to the tissue or organ, considered in itself as a particular entity; the other to the part which it acts in the general assemblage of functions, which constitutes the individual. Take any organ for an example: thus, by the function of nutrition, that peculiar texture of a muscle is preserved, by which it is enabled to contract—or, in other words, perform the function, whereby it contributes its share towards the preservation of the body; by the function of nutrition, the liver is preserved in a state suited to the performance of its general function, the separation of bile from the blood; from the same function of nutrition are derived those physical qualities, upon which the general functions of bone depend, or the functions by which it is enabled to support and protect the softer organs, and serve the purposes of levers of motion. The first kind of function, or the function of nutrition, is strikingly analagous in its immediate object in all organic textures: exhibiting in each only slight peculiarities. Whereas the second kind of function is very dissimilar in different organs: thus, what resemblance can we observe between the secretion of bile, the contraction of a muscle, and the perception of a nerve. That function of a part, by which it forms and preserves its own structure, may be called the *primary* function of the part, and the function, which it performs for the preservation of the general system, its *secondary* function.*

The kidney cannot, in the natural state of the body, secrete bile, nor the liver urine; bone is unable to exhibit the phenomena of muscular contraction, nor can muscle perform the function of bone: to these might be added numberless instances, in proof of the connexion

* It is obvious that I confine the term *nutrition* to the last act in the series of functions, by which organic bodies receive, assimilate, appropriate, and afterwards discharge from the system, those substances which serve, for a time, to form and support the organic structure—the preliminary acts to the act of nutrition being digestion, absorption, sanguification, circulation, &c. &c.

which exists between the secondary functions of parts and their structure, which is the result of their primary function. This connexion is, in fact, under every circumstance, so evident, that we are necessarily led to the conclusion, that structure and function are inseparably connected, and that the latter is related to the former, as an effect is to its cause.

If structure be the cause of function, it follows that no modification can take place in function that is not preceded by a corresponding alteration in structure; nor can any modification of structure occur, without necessarily inducing a greater or lesser modification of function.

If the foregoing reasoning be correct, (and there does not appear any evident source of error,) it necessarily follows, that all altered functions, and consequently all functional disease, must be preceded by a derangement in structure. Nor does the argument receive any opposition from the reflection that these alterations in structure are not *on all occasions* cognizable by the senses: For our senses are not always able to detect peculiarities of organization, although we may logically conclude that they exist. Thus, for example, we are often unable to point out any differences in the structure of the ova of oviparous animals, although, from the products which result from these germs of animal existence, we are forced to conclude that there are essential differences, but we have no acquaintance with these differences, except by their effects. We must, therefore, be content on many occasions to reason from analogy; and look forward to the period, if that should ever arrive, when we shall possess more accurate means of examining diseased textures.

Thus it appears, as function results from structure, all functional disease must arise from altered structure; and as all structure results from the function of nutrition, there can be no alteration in structure, without a cor-

responding alteration in this function. Hence, all diseases essentially consist in a morbid state of the function of nutrition, or of the primary function of organic parts; at least we must arrive at this conclusion in our present imperfect stage of knowledge.

On examining this subject more minutely, it may be asked, since all functions depend on structure, what is the organization upon which the primary function, or the function of nutrition depends? To this no ultimate satisfactory answer can be given. Here our researches must end. Our Creator has said, so far shall you come, and no farther. We see every where, in our investigations of nature, a finite barrier. Thus, if we examine the structure of an artery, we find it to be composed of three membranes. If the structure of these membranes be examined, we discover in them the existence of certain elements of organization, such as minute vessels, minute nerves, &c. and we may say that the membranes of the artery result from the action of these. Further than this we cannot go, although we must feel convinced, that these *vasa vasorum*, or *nervi vasorum*, must be themselves composed of some more minute subdivision of organic parts, or, else, how are they formed?

In thus assigning a structural, and consequently, a vascular origin to all diseases, it is necessary to point out the difference which exists between this view of the matter and that which has been taken of the same subject by one of the brightest ornaments of our profession: a man in whom were united the rare qualities of profound and accurate observation, with industry which could not be surpassed—and who, at the same time, enjoyed a field for investigation seldom equalled: is it necessary to say, that the individual to whom I allude is the late Dr. Parry of Bath?

The diseases which form the subject of this publication, are referred by Dr. Parry, in conjunction with the ma-

jority of diseases to which the human race is subject, to an excessive determination of blood to the organs which are the seat of the deranged functions. But it must have been known to this highly gifted author, that many of those diseases never exhibit any sign of preternatural accumulation of blood, either during life or on dissection; and that, in fact, an opposite state, or state of diminished vascularity, with either a shrinking or induration of parts, will be often found after death.

But let it be supposed, for argument's sake, that, in each, or all, of the diseases in question, there is an accumulation of blood, with or without increased momentum, is this accumulation of blood to be considered the cause or the effect of disease? If we consider it the cause, are we not granting to the blood a *primitive* activity in the system, to which we cannot consider it entitled. In fact, although the influence of both the quantity and quality of this fluid in the organs, is of the first importance in giving a character to the disease, and in affording grounds for certain modifications of treatment, we are to bear in recollection that its increased quantity must be considered as an effect, and not a cause; for it is evident that blood could not accumulate in a particular organ, without previous disease of the vital powers of the solids of that organ.

Observe, therefore, that, although it may be admitted that a given disease always exhibits a preternatural accumulation of blood in its seat, the mode of treatment which will be adopted by the pathologist, who attributes the accumulation to the state of the vital properties of the solids, will be widely different from that of the practitioner, who merely looks to the quantity of the fluids: the prime object of the former will be the restoration of the vital powers of the vessels to a natural state, always mindful of the influence which the fluids may have on

these vital powers ; while the latter will consider that, if he can, by any means, diminish the quantity of blood in the part, he must of necessity remove the disease. The futility of such principles of treatment will not, perhaps, be readily conceived by a young practitioner ; who, from the nature of the doctrines, which now prevail in the schools, considers the lancet and the leech as the grand remedies for every disease, accompanied by vascular congestion. His views will, however, *if he has judgment*, be soon corrected ; and he will find, on many occasions, that as long as he limits his attention to the abstraction of blood, at the expense of neglecting the state of the solids, he will daily observe diseases, evidently accompanied by an increased quantity of blood in their seat, proceed from bad to worse, attracting to their foci, as long as life continues, the contents of the vascular system. That these views are not incorrect, and that they are founded on experience, I could easily establish by cases which have occurred to my own observation, and by the experience of others of accurate reasoning and extensive research.

There are three authors who have made some remarks connected with this subject, and whose remarks have just occurred to my recollection. Mr. Abernethy observes, p. 56, of his *Surgical Works*, Vol. I. “ I would ask too, practically, does blood-letting cure disorders in which there is a fulness of the vessels of the head ? It must be granted, that in many instances it temporarily alleviates them, but in others it fails to relieve and even aggravates them.” Dr. Prichard in his work on *Diseases of the Nervous System*, observes at p. 72 :—“ I have sometimes seen repeated venesections ordered for patients labouring under attacks of paralysis, which had evidently proceeded from determination of blood to the head ; when, after every successive abstraction of blood, the disease seemed ra-

ther aggravated than relieved : and in cases which appeared to be precisely similar, I have witnessed the most decided benefit to accrue from discontinuing the practice of depletion, and adopting a gently stimulating plan of treatment : and I can make a similar assertion respecting several other disorders of the nervous system." The following remark taken from Mr. Swan's little Treatise on the Nervous System, is quite confirmatory of the observations of Mr. Abernethy and Dr. Prichard. At page 45, Mr. Swan remarks, "When a person has become subject to dizziness," (a complaint which I believe to be uniformly attended by an accumulation of blood in the brain), "though he may, in the first instance, have been relieved by bleeding, yet should the complaint soon return, and especially if the body is much debilitated, a farther loss of blood will not only not relieve it, but will, on the contrary, increase it." He recommends for its removal, under such circumstances, bark and generous diet, a recommendation which will be found to correspond with the views of disease which I have taken in this publication.

The reader will not of course form the opinion that the remarks, which I have just made respecting the practical inference to which the doctrine of Parry would appear to lead, are meant to apply to the therapeutics of that excellent pathologist ; * for it cannot be doubted, that if he

* I have called it the DOCTRINE of PARRY, although traces of similar opinions may be found in the writings of several Physicians. Dr. T. HOFFMAN, was reproached with making the LOCAL DETERMINATION of BLOOD the cause of FEVER, of INFLAMMATION, of SPASMODIC, and of most other diseases. Yet Dr. PARRY is fully entitled to the honor, for to use the language of Dr. PRING in his PATHOLOGY, p. 105, "It is indebted for its improvement, perhaps for all the perfection of which it is capable, to the late Dr. PARRY, whose works on this subject are written in a spirit of true philosophical research, which has been equalled by few of his cotemporaries, and has rarely, in medicine, at any period, been surpassed."

had been spared to complete that luminous view, which he has taken of disease, he would have so explained his doctrines, as to have made them the foundation of a correct system of treatment. I, therefore, have merely alluded to the impression, which I think they must make on the generality of readers in their present state; and to the impression which they appear to have already made on many practitioners of superficial views, leading them to false analogies, and to consider that, in the employment of the lancet and other evacuations, the whole practice of medicine consists.

A full and scientific examination of the various causes of organic disease, or of disease of nutrition, would form an enquiry at once of the first importance, and of the most difficult kind. As yet, our knowledge on this subject is extremely imperfect. On many occasions we are in total ignorance of the cause of disease, and we cloak our ignorance by denominating such diseases spontaneous. Even on those occasions, when the cause is evident, we can seldom afford any satisfactory explanation of its mode of action. We know that some causes act on the part which becomes diseased, in an immediate and direct manner; we also know that, on other occasions, the causes are applied to parts very remote from the seat in which diseased action begins; and it is remarkable, that it very often happens, on these latter occasions, that no perceptible effect arises in the part to which the cause has been directly applied.

Among those causes which excite disease in the part to which they are applied, we place mechanical and chemical agents; and of those which act by their influence on parts remote from the seat of actual disease, we may adduce many substances, which, when introduced into the stomach, cause organic diseases of the skin, or in other

words, cutaneous inflammations. Let the reader bear in mind this evident proof that certain states of the stomach can cause remote disease, and he will have an apt illustration of the well-known influence of derangement of the digestive and other organs, in causing structural disorder.

Therefore, while the views which I have adopted admit the importance of disease of the digestive organs, or of any other important organs, in causing or keeping up organic disease in remote parts, it must be clear, from what I have said, that I consider the views of those practitioners, who do not look beyond such causes, as too partial. Although the removal of these causes forms an important link in the chain of indications, it is evident that the attention of the practitioner must extend still further, for there is nothing more true than that disease, once excited, will often proceed after its cause has been removed. If this was not the case, the disorders of the digestive organs, &c. would not require any other treatment than the removal of their cause ; and proceeding a little further, we would arrive at the conclusion, that the removal of cause is our only indication in the treatment of disease : an important indication, certainly, and one which must always be fulfilled, otherwise, let the disease be ever so completely removed, if it be possible to do so while the cause remains, it must, as a matter of course, quickly return ; unless the diseased action has been of such a kind as renders the system insensible to a second impression of the cause, as is the case with some morbid poisons.

Did the limits of this publication permit, or were it at all necessary, the foregoing doctrines respecting the cause of those diseases commonly denominated functional, could be made to receive the most ample illustration and support from a particular examination of the origin, progress,

and termination of the painful, convulsive, and paralytic affections under consideration. It could, in fact, be easily shewn, that a disorder of structure, or of the function of nutrition, of those organs or textures, which form the seat of these diseases, afforded a most ready explanation of all their symptoms ; that a similarity of origin or cause could alone account for innumerable circumstances connected with their history, such as their mutual succession, or frequent conversion into each other ; their simultaneous occurrence in the same individual, or in different individuals of the same family ; the similarity of appearances in the organs or textures affected, as exhibited on dissection ; the similarity in the processes of natural cure, when left to the unrestrained exertions of the system ; and the similarity of the general principles of artificial cure : for, it would appear, that although the different diseases required sometimes different modes of treatment, such differences would not be found to be greater than those required by cases, apparently the same, but under different circumstances.

Holding in view the conclusion, that all diseases are essentially vascular or structural, and that the grand principle of their treatment consists in the restoration of the vascular solids, which are the seat of disease, to a state of healthy action, together with the removal of their cause, I shall now investigate the mode of operation of Moxa, for the purpose of determining the state and stage of disease to which it is suited, the principles which should regulate us in its employment, and the source from whence its powerful influence is derived.

SECTION II.

OF THE MODE OF ACTION OF MOXA.

“ Medicos tandem tædet et pudet, diutius garrere de Remediis, Specificis, et Alexipharmicis, et cæteris, nisi eorum naturam et modum quo prosint, quodammodo ostendere et explanare possint.”

CONSPECT. MED. THEOR.

ALTHOUGH the employment of Moxa may be traced long prior to the existence of medicine as a science, it would be useless to investigate the principles, if any existed, upon which this remedial agent was employed, at times, or in countries, in which the light of modern physiology had not shed its lustre. Indeed, even in the writings of those eminent Surgeons of the present day, to whom the powerful agency of this remedy is so well known, and who have presented us with a mass of facts, which incontestably prove its efficacy, there is nothing that can satisfy a strict physiological mind, or afford any pathological principles to regulate our conduct, either as to its mode of application, the exact cases to which it is suited, or the remedial adjuvants, which should be employed in conjunction with it. Even in the writings of Baron Larrey, we cannot fail to observe, and deeply to regret, how seldom

it happens that correct physiological reasoning guides us in matters of practice; for, unless I am much mistaken, the following sentences, in which the Baron explains his opinion of the mode of action of Moxa, will be scarcely intelligible to the reader; and still less afford him any satisfactory explanation of the manner in which it acts. The Baron observes, "Ce moyen," (le Moxa) "d'ailleurs nous a paru communiquer dans les parties, avec une masse relative de calorique, un principe volatil, très-actif que fournissent les substances cotonneuses, lorsqu'elles sont en combustion. L'excitation et l'irritation qui résultent de la combinaison de ces deux produits développés par l'insufflation, se propagent de proche en proche jusqu'aux parties les plus profondes, de manière à rétablir l'action des nerfs affaiblis ou paralysés, à arrêter la marche de la cause morbide établie dans telle ou telle partie."*

It has often struck me remarkably, in tracing the various opinions, which may have existed respecting the mode of action of remedies of indubitable efficacy, that theories, however different, however absurd, and even adverse, do nevertheless generally coincide as far as relates to practice, as well with each other as with long established empirical usages; each bending, as it were, and conforming, in order to do homage to truth and experience. Take Iron as an example. The advocates for the mechanical theory favoured the introduction of the preparations of this metal in scirrhus and cancer, upon the hypothetical principle, that whatever is the most forcible in removing obstruction, must be the most proper instrument of cure. Such, say they, is steel, which, beside the attenuating power with which it is furnished, has still a greater force from the gravity of its particles, which being seven times

* See "RECUEIL de MEMOIRES de CHIRURGIE, Par le BARON D. J. LARREY. A. Paris, 1821," pp. 7, 8.

specifically heavier than any vegetable, acts in proportion with a stronger impulse, and therefore is a more powerful deobstruent. Unlike the Mechanical Physicians, the Chemists explained the beneficial operation of Iron upon the principle that it increases the proportion of red globules in the blood, (which they conceived to be dissolved by the virulence of the disease,) on the erroneous hypothesis that Iron constitutes the principal element of these bodies; and, among ourselves, within the last few years, the most absurd of all the speculations respecting Iron has been advanced. Thus, the late Dr. Adams having promulgated the fanciful and groundless opinion that scirrhus and cancer were parasitical animals,—Iron, which had been used by the Mechanical Physicians, upon the principal of a deobstruent, and by the Chemical Physicians as an important means of influencing sanguification, was immediately brought forward, by another practitioner, with all the inflated eulogiums of a newly discovered specific for cancer; and its mode of action explained by him upon the principal of its killing those parasitical animals, upon which the existence of the disease was fancifully supposed to depend!!—Hence, we may say in the words of Celsus, “Nec post rationem, medicinam esse inventam, sed post medicinam inventam, rationem esse quæsitam.”*

I have remarked already, that the action of Moxa was generally compared to that of a blister or issue; and I may add, it has been thereby argued, that this remedy does not afford any *peculiar* means of combating disease. I have also remarked, that the incorrectness of these opinions was evident from the considerations, that, in the employment of Moxa, it should ever be a grand object to prevent that state upon which the action of a blister depends, viz. inflammatory action; and that when this state

* See Pharmacologia by J. A. Paris, M. D.

was excited, the remedy was either altogether unsuited to the case, or there was an error in the manner in which it had been employed. I added, that although on some occasions, in which the Moxa was indicated, the formation of a drain might be useful, the specific action of the Moxa occurred, and was terminated, long before the drain was established; and, consequently, that its beneficial influence could not be attributed to that cause.

It must be admitted that the state of the capillaries, or of those minute vessels, which form the medium of connection between the termination of the arterial and origin of the venous system, holds an important rank in the chain of causes which produces structural disease. If the reader requires a proof, let him call to mind cases of the following description. A patient has been attacked by strumous or pustular inflammation of the eye; a Surgeon has been consulted; leeches, blisters, purgatives, emollient collyria, have been employed; still there is excessive intolerance of light, copious discharge of tears, the patient painfully shrinks from every effort, which may be made to open the eyelids; if the Surgeon attempts by force to separate them, he succeeds with difficulty—his attempt being resisted by a spasmodic contraction of those muscles which close the lids, accompanied by a gush of tears. If a glimpse of the cornea be obtained, it is found to have hid itself involuntarily behind the origin of the upper lid; and to exhibit, on some part of its surface, an ulcerated depression, forming a centre, to which a pencil of vessels lead from the morbidly vascular conjunctiva. The Surgeon acquainted with the history of the case, either from the treatment adopted by himself or from the account of the patient, drops into the eye a watery solution of the nitrate of silver; some trifling pain is excited, and in a few hours the irritability of the eye is nearly subdued.

On the following day his patient exhibits the organ, but is unable to persuade himself that a single application of a few drops of a colorless liquid could produce such magical effects. In connection with such cases I may mention, as scarcely less striking, those cases which exhibit the beneficial effects of a weak solution of the sulphate of alumen, applied at a proper period in purulent ophthalmia; the effects of the sulphate of zinc on the urethra or vagina in certain cases of puriform secretion from these canals; and the influence of astringents in diarrhœa. All the foregoing applications belong to that class of local remedies, which may be called stimulating astringents, or local tonics; and, there cannot exist a doubt, that they produce their effects by an action on the capillaries.

Let the reader now reflect on the rapidity with which the foregoing remedies act and restore to perfect health, parts which have been for a long time the seat of disease; and he must admit that, if I can prove the remedy in question to act on the same principle, and that the diseases to which it is suited are, so far as relates to their mode of cure, similar in nature to those over which the remedies mentioned have so striking an influence, there will be no difficulty in explaining the rapid and remarkable efficacy of Moxa in the cases to which it is applicable.

When we consider the utility of topical remedies in removing superficial diseases, such as ulcerations of the cutaneous surfaces, of some parts of the mucous surfaces, abscesses which communicate with the skin, a great variety of diseases of the eye, &c. &c.—we often regret that we are not possessed of any such means of influencing the more deeply seated organs, and we irresistibly come to the conclusion that many internal diseases—such, for example, as abscesses of the lungs, of the liver, ulcerations of

the deep-seated mucous surfaces, &c. &c., which are, in our present state of knowledge, incurable—might be removed on many occasions, could we reach them with our topical remedies. I say, when we reflect on these considerations, it is evident that the Moxa must afford a powerful and valuable assistance in the treatment of deep diseases, if it be capable of acting on them as our most valuable topical remedies act on those which are superficial.

The experiments, which have been made in our days on the capillary circulation, appear to me likely to lead to very important improvements in the application of our topical remedies; and I conceive that the profession are highly indebted to Dr. Wilson Philip, who led the way in this mode of investigation, and to Dr. Hastings, who has so ably followed in his steps. In the performance of experiments, undertaken with the avowed view of investigating the truth or falsity of a preconceived hypothesis, the mind is so naturally, so irresistibly, I had almost said so uncontrollably bent on seeing whatever is most congenial to its own prepossessions, that I consider myself particularly fortunate in being able to support by the experiments of the pathologists, whom I have just mentioned, the opinions which I have formed of the mode of action of Moxa. As the experiments of these respected authors have been undertaken with an entirely different object, and as it cannot be supposed that there exists, in the account which they have given of them, the slightest straining to meet the hypothesis, they will scarcely fail, if they support my opinion, to be received by the reader as conclusive evidence. I shall, therefore, refrain from bringing forward any experiments made by myself, in elucidation of the subject, except on one or two occasions; and, on these occasions, the experiments do not afford the slight-

est room for error, and may be repeated by the reader without difficulty of any kind.

I shall now proceed to the relation of these experiments, and, I trust, they will prove to the satisfaction of the reader that caloric possesses the power of exciting the capillary vessels of a part to increased rapidity of circulation; that it causes an increase of their tonicity, with diminution of their calibre; and, consequently, that Moxa, whose influence depends on the caloric disengaged, must act as a stimulating astringent or local tonic.

EXPERIMENT I.

“After having observed the natural state of the circulation,” (in the web of a frog’s foot,) “the foot was immersed in water of 110 F° for half a minute. On bringing it again immediately into the field of the microscope, *the motion of the blood in all the vessels appeared quickened, and they were contracted.* After an interval of two minutes, the foot was again immersed into water of the same temperature, and for a similar time. *The result was as before.*”*

EXPERIMENT II.

“The circulation in the web of a frog’s foot being first attended to, and the foot then immersed in water heated to 115 F° for half a minute, *the motion of the blood was immediately quickened, and the vessels in some degree contracted.* The immersion was repeated with the same effect.”†

EXPERIMENT III.

“I passed a hot iron through the web of a frog’s foot, by which the skin about the hole was shrivelled, and the

* “See a TREATISE ON INFLAMMATION of the MUCOUS MEMBRANES of the LUNGS,” &c. &c.—By CHARLES HASTINGS, M. D. LONDON, 1820.—p. 81.

† HASTINGS, Loc. cit. p. 55.

vessels obstructed, no fluid of any kind being discharged. *No symptom of inflammation followed, every part of the web appearing as pale as before the experiment.*”*

EXPERIMENT IV.

“An inflammation had been excited, I do not know how, in the web of a frog’s foot; having applied it to the microscope, I found the *vessels of the part greatly dilated*, and the *motion of the blood extremely languid*. In several places where the inflammation was greatest, it had ceased altogether.....I wetted the inflamed web with distilled spirits, at the same time *throwing on it the concentrated rays of the sun, from the reflector of the microscope*. The blood in all the vessels, except in those of the most inflamed part, began to move *with greater velocity*; and in proportion as this happened, *their diameters were diminished*, their interstices became less opaque, and the *redness of the part was evidently lessened*. After I had despaired of restoring action to the vessels of the most inflamed part, I saw the blood begin to move slowly in a vessel which ran directly through the middle of it. It soon acquired a considerable velocity, and on taking a superficial view of the part through the microscope, the course of the vessel appeared like a streak of a lighter colour through the middle of the inflamed part.”†

EXPERIMENT V.

The following experiment was made on Mary M’Keogh, an intern patient of Jervis-street Infirmary. She had been admitted on the 22d July, 1826, on account of a gangrenous ulcer on the anterior and outer part of the right

* “A TREATISE ON SYMPTOMATIC FEVERS, by A. P. W. PHILIP. 4th Edition.”—pp. 5, 6.

† A. P. W. Philip, loc. cit. pp. 15, 16.

leg. The experiment was made on the 4th of September : the granulations being then exuberant and spongy. With the assistance of a lens, the capillary vessels could be seen ramifying through them in a beautifully arborescent form. The granulations were much disposed to bleed ; and the integuments surrounding the ulcer were thin, of a brownish color, exhibiting numberless minute vessels in its texture ; which vessels became enlarged and distended with dark blood, if she allowed her leg to hang for a short time : it is proper to observe, that she was subject to occasional discharges of blood from both stomach and intestines.

The size of the capillary vessels in the ulcer having been previously examined with a lens, I burned a Moxa over the surface of the ulcer, gliding it along during its combustion ; and holding it at such a distance as to produce a keen feeling of heat. When the Moxa was burned out, *a diminution in the size of the capillaries was evident, and this diminution was more remarkable, when the ulcer was examined the following morning.*

EXPERIMENT VI.

Richard M'Donnel, aged 56, residing at No. 4, Lower Exchange-street : a man in the habit of earning a livelihood by teaching among the poorer class of children, applied at the Infirmary for the Treatment of Rheumatic and Cutaneous diseases, on the 6th of September, 1826, on account of chronic inflammation of the conjunctiva, accompanied by a *very dilated state of the capillaries* of this membrane. On the 10th of September, I applied a Moxa to the eye, in the same manner as I had applied it to the ulcer of the leg in the preceding case. *A contraction of the capillaries of the conjunctiva resulted, which was observable in half an hour after the application of*

the Moxa, but still more obvious on the following morning.

It is evident that the conclusions, which are naturally deducible from the preceding direct experiments, must receive additional support, if they are conformable to the opinions of authors, whose accuracy we must respect; and, particularly, if such opinions have been founded on an entirely different order of phenomena, and promulgated with an entirely different object. It is, therefore, with much pleasure, that I can bring to the recollection of the reader, the following observations of the highly scientific Mr. Pearson, as detailed in different parts of his "Principles of Surgery." "Perhaps it may appear paradoxical to some, when they see it affirmed, that heat by its proper effects *stimulates and invigorates the body*."* "When heat is considered in relation to the senses of an animal, it may be regarded as a very powerful stimulant *inciting the moving powers of the living fibres to action*."†..... "Heat produces more or less of an expansive motion in all dead matter; whereas such a degree as is consistent with life and health, *occasions a contraction and an increase of tone in the living fibre*."‡..... "If a substance possessed of above 120° of heat be applied to the living body, it will *accelerate the motions of the blood vessels of that part, increase the contractility of their parietes, produce redness, and augment sensibility*."§

Nor can I avoid observing, that there appears among the most ancient authors, some just conceptions respecting the mode of action of caloric on the living texture. We frequently meet with the phrase, *ignis firmat partes*; and, as Pouteau remarks, "Cet axiome apprend que le

* "PRINCIPLES OF SURGERY, &c. By JOHN PEARSON, F. R. S. LONDON, 1808." Preface, p. xix.

† Loc. cit. p. 173.

‡ Loc. cit. pp. 176, 177.

§ Loc. cit. p. 175.

feu fortifie les parties sur lesquelles on l'applique, et les met à l'abri du retour de la maladie dont ont les a délivrées." "The gout," says Galen, in the sixth book of his Aphorisms, "has two causes; the first is the superabundance of gouty humour upon the articulations; and the second is, the weakness of the articulations, which gives way to this humour, and if one of these causes is wanting, the gout will not appear." "Therefore," observes Prosper Alpinus, "by cauterizing the extremities threatened with gout, this humour cannot enter them, *because the fire strengthens the parts.*" Again he adds, "The Egyptians by means of fire correct the relaxation and the weakness of the articulations. It is, therefore, an excellent remedy for all parts *attacked by fluxions.*"*

The foregoing experiments and observations fully authorize the conclusion, that the application of a certain degree of caloric to the living body, is followed by a *contraction of the capillaries*, and an *increase in the rapidity of their circulation*; and that this contraction does not proceed from a mere *physical* action, but is the result of the influence of the heat on the *vital properties* of the vessels.

But while it must be admitted that such is the immediate effect of caloric, it may be conceived that this influence is only transient or temporary; and, therefore, not likely to afford any permanent assistance in controlling or removing diseased action. It appeared, therefore, important to decide, whether the influence of caloric in exciting the actions of the living body, persists after the period of its application. With that object in view, the following experiment was made, and several times repeated with the same result.

* "ŒUVRES POSTHUMES, de M. POUTEAU. Tome Premier," p. 223. & p. 286.

EXPERIMENT VII.

I introduced one of my lower limbs into a fumigating apparatus, at the Skin Infirmary : the apparatus having been previously heated to the temperature of 120 F^t. On taking my limb out, after it had been enclosed in the apparatus twenty minutes, its surface was red, covered with moisture, and its temperature four degrees higher than that of the opposite limb. I now went into a cold bath : temperature 56 F^t. Having remained in it for ten minutes, I found the temperature of my lower limbs on coming out of the bath exactly alike, and four degrees lower than they were prior to my introducing my left limb into the fumigating apparatus. I now remained quiet for half an hour, and upon examining the temperature of my lower limbs, I found the limb which had been in the fumigating apparatus had acquired its natural heat, but that the heat of the opposite limb was yet two degrees lower than natural; and it did not recover its full temperature for several hours.

I have the satisfaction of observing, that the preceding experiment receives full confirmation from the experiments of Edwards, detailed in his admirable work "*De L'Influence des Agens Physiques sur la Vie.*" He observes, at p. p. 250, 257, "*Après un refroidissement capable de diminuer la production de chaleur, le séjour dans une température élevée favorise le rétablissement de cette faculté; car, en exposant les animaux à de nouveaux refroidissemens, leur température baissera d'autant moins vite qu'ils auront été exposés plus long-temps à la chaleur. Il s'ensuit que l'effet de l'application d'une chaleur convenable se prolonge après la cessation de la cause.*"—Again, "*Il est nécessaire de se bien pénétrer de ce principe, que l'application passagère de la chaleur produit des*

effets qui se continuent au delà du temps de son application."

—"On voit par là que lorsqu'on est dans les cas d'être souvent exposé à un froid très-vif, on se dispose mieux à le supporter en se procurant dans les intervalles une forte chaleur; usage des peuples du Nord justifié par les faits précédens."* These facts satisfactorily explain also the manner in which the system bears the practice, sometimes adopted by me, as I shall hereafter mention, of applying cold, immediately after the patient has been exposed to a high temperature: the principles which explain the beneficial therapeutic influence of this practice, will be also spoken of hereafter.

The foregoing experiments and observations, taken in conjunction with experiments 5 and 6 above detailed, fully authorise the conclusion, that the tonic power of caloric persists long after the period of its application: a conclusion which I might, indeed, have been allowed to make from analogy, without any direct proof; for caloric is at least as powerful an agent as those stimulating astringents, whose effects we observe to persist for an indefinite period after their employment: such for example as the solutions of the nitrate of silver, of the sulphate of copper, &c.

There exists another question respecting the application of caloric, viz. are its effects limited to the point to which it is directly applied, or do they extend more or less beyond this point? For, it is evident, that if its influence be limited to the surface of the skin, or to the part to which it is directly applied, it can have little or no effect on deep seated or extensive disease; but, on the other hand, if it

* From our sensations, we would be led to form a different opinion; but they afford us no correct knowledge of the temperature of our body: we often feel cold, when the thermometer denotes a high range of temperature, and vice versa.

be capable of extending its influence to the deep seated parts, it becomes a most important agent, because it may be said to be, perhaps, the only one we are acquainted with, which has this power, and which is possessed of the same mode of action.

In discussing the question of the capability of caloric, to extend its influence along a living texture, beyond the point to which it is applied, we should distinguish the physical from the vital power. There are many who, perhaps, will not be disposed to admit that the power, which caloric possesses of establishing an equilibrium of temperature among all inorganic bodies within its reach, can be considered to operate in living structures; though I cannot conceive how this can be denied, when we reflect on the power of external heat to cause such a dilatation of the living fluids as will produce not merely a fulness of the superficial veins, but even rupture of the deep seated vessels, and consequent mortal effusions into the vital organs: the unfortunate occasional effects of hot baths.* Let, however, this physical influence of heat be denied, there still remains abundant proof that it possesses the power of exciting an action, which can be propagated or extended along the living structures, far beyond the part to which it has been applied.

It has been proved above, that caloric acts on the capillaries, as a local tonic or stimulating astringent; and the power which this class of remedies possesses, of extending their influence by sympathy, from the part to which they

* Unless we admit that there exists a dilatation of fluids on these occasions, it will be impossible to account for the influence which external heat exercises on the deep seated organs. When we consider the quantity of blood, which is determined to the skin by hot baths, &c. it is clear that a smaller quantity must exist in the viscera: therefore, how can we account for a rupture of their vessels, unless we admit a dilatation of fluids, or a contraction of solids—the increased action of the heart cannot account for these consequences.

have been applied, along continuous surfaces or similar textures, is well known. How are we to explain, but in this way, the influence of cold applied to the skin in stopping some of the most profuse hemorrhages from the mucous surfaces? even uterine floodings! And is it not upon the principle of continuous sympathy, to use the language of Mr. Hunter, that inflammation extends from a given point of a vein, through all the venous system, or from a point of a serous or synovial membrane, through the entire extent of that membrane, be it great or small. Is it not quite certain that a number of our tonic remedies, such for example as Peruvian bark, produce their effects on the remotest part of the vascular system, by the impression which they make on the stomach? Nor is it difficult for any person to conceive the possibility of such a sympathy, who has ever experienced "the thrilling and singular feeling, which is produced over the whole body by the acerb taste of the juice of the slow."

Now the direct effects of the Moxa are seldom, if ever, limited to the skin. If an eschar be formed, that eschar extends to the superficial fascia or subcutaneous cellular tissue: and if the Moxa be applied through the medium of a needle, in the manner which I shall hereafter describe, the caloric may be made to extend its influence as deep as we please, by the conducting power of the needle. If the caloric, by either mode of application, be made to act on a *point* of structure, which extends itself indefinitely through the limb or part of the body in which it is seated, as for example the cellular tissue, or the neurileme of a nerve, or the tunic of a vessel, it is perfectly consistent with our knowledge of the mode of action of such remedies, to suppose that its effects may be extended to any length along the texture so acted on.

I am not, however, limited in my proofs of the power

which caloric possesses of extending its influence through organic textures, to analogical reasonings. The reader will find convincing, though unfortunate, demonstration of this influence in the writings of Pouteau* and De Haen.† The former of these authors has recorded one case, and the latter two cases, of fatal inflammation of the brain, produced by the incautious application of the actual cautery to the head. And it is to be recollected, that the vascular texture of the brain is not continuous with that to which the application was made, but merely contiguous, and consequently not so favorable to the propagation of the influence of heat: for it is well known that continuous sympathy is more powerful than contiguous.

There are some phenomena of daily observation, which, if they have occurred to the mind of the reader, may appear to militate against the conclusions I have drawn, respecting the astringent or tonic action of caloric on the capillaries. I allude to the power which the common external application of heat, (as in the instance of approaching a fire,) evidently possesses of causing redness of the skin and a fulness of the superficial veins; for it would appear, upon a first view, that these states are not compatible with the conclusion that caloric produces a contraction of the capillaries. These phenomena are, however, most easily explained.

It is clear, that if the circulation in the capillaries be more rapid than usual, a larger quantity of fluid must pass through them from the arteries into the veins; and as the power of propulsion, possessed by these latter vessels, is not increased, nor their tunics excited to unusual contraction, in the same proportion as the capillaries, it is evident

* "Œuvres Posthumes, Tome 2." p. 44.

† "ANTONIO de HAEN, RATIO MEDENDI, VENETHIS, 1785. Volumen secundum. Cap. xii. De cranii ustione," &c. p. 195.

that there must be an additional quantity of fluid in them ; which, joined to the dilatation of this fluid, from the increase of temperature, will sufficiently account for their enlarged size and turgid state. In the next place, to account for that general blush, which evidently denotes an increase in the quantity of red globules in the capillaries, we must reflect on the appearance of these vessels as viewed through a microscope, during natural circulation. On this subject, I shall adduce the remarks of Dr. Hastings. He observes, “ With regard to the appearance of the blood in the vessels, (under ordinary circumstances,) it may be remarked, that small globules float in a serous fluid. These globules approach much nearer to each other in the arteries and veins than in the capillaries. The most minute of the last vessels admit only one globule at the same time ; and a considerable space intervenes between them, in which space serous fluid is alone observed..” Again he observes, “ When the light is very bright, the globules appear,” (in the capillaries) “ *almost pellucid.*” * It is evident that an increase in the rapidity of circulation must have the effect of producing, in the three orders of vessels, a more uniform distribution of red globules and consequently an augmentation of the number of these globules in the capillaries ; and thereby an increased redness, by causing those globules to become visible, which before were “ *almost pellucid.*” Consequently, the supposition, that the capillaries are in these cases dilated, is altogether unnecessary : a supposition which is, moreover, opposed to facts already laid down, as the result of direct experiment.

The sufficiency of the means above-mentioned to produce the effects observed, cannot be better illustrated, than by the following extract from the “ *Traité des Ma-*

* Hastings, loc. cit. p. 46.

ladies Chirurgicales," of the accurate and experienced Boyer. "Dans toutes les parties même les plus blanches, le sang circule, et ses globules conservent la couleur rouge qui est leur couleur radicale; or, comme les vaisseaux sanguins des ces parties sont extrêmement déliés, et qu'ils ne reçoivent, pour ainsi dire, que des globules isolés, ils ne se montrent pas avec leur couleur rouge; de même qu'une goutte de liqueur colorée, dans un tube transparent et capillaire, ou une lame de verre colorée extrêmement mince; paroissent blanches. Mais que plusieurs globules de sang réunis s'agglomèrent dans un vaisseau où ils ne passent, dans l'état naturel, que les uns après les autres, ils se montrent, avec leur couleur rouge, à travers les parois minces et transparentes de ce vaisseau, comme plusieurs gouttes de liqueur colorée, réunies dans un tube transparent, paroissent avec la couleur qui leur est propre."*

The foregoing remarks are, however, meant to apply only to the immediate effects of heat on the skin; for if its application be continued for a considerable time, it is found that there results from its action on the capillaries an entirely different order of phenomena. The excitement, which had been produced in the first instance by heat, causes by its continuance an exhaustion of the tonic power of the vessels, and a consequent relaxation and dilatation. There will be then an increased redness from debilitated capillaries. These facts are fully deducible from the experiments of Dr. Hastings. Thus, at the conclusion of his account of Experiment 1, above cited, and which I have extracted from his work, he observes, "After a *third* immersion of the foot in water of the same temperature, and for the same time, the vessels were dilated,

* Tome Premier, pp. 10, 11.

the blood moved *more slowly*, and was much redder. To the naked eye the web seemed inflamed. For the *fourth* time the web was put in water of the same temperature for one minute. The arteries, veins and capillaries, became *greatly dilated*, and *the motion of the blood ceased*, excepting in one artery," &c. And in like manner at the conclusion of Experiment 2, above related, and which is also extracted from Dr. Hastings's work, he remarks, "After the foot had been immersed *five* times in water of the temperature as above, (115 F^t.) the vessels were *much dilated*, the blood, became redder, moved *slowly*, and no globules could be seen; but it appeared converted into a red mass." This important fact, that a stimulating astringent will, if applied beyond a certain time, produce an opposite effect to that which, at first, follows its application, shall occupy my attention hereafter.

It has been long since observed by Sæmering, and his observations have been confirmed by others, that the functions of the absorbent vessels are impeded, more or less, in the state of inflammation. From some experiments of Magendie on the influence which plethora of the vessels exerts on absorption, it might be conceived that the distended state of the capillaries, in inflammation, would account for the deficient action of the absorbent vessels in that state. If such be the relations which exist between these two orders of vessels, it will follow, that whatever shall increase the action of the capillaries, will also increase the action of the absorbents; and as caloric has this effect in so remarkable a manner, it might be asserted, *a priori*, that it would afford the means of exciting languid absorption. Or, if the lymphatic vessels are capable of being directly influenced, when they are in a state of atony, by stimulants, it is probable that those stimulants which can act on the capillaries, will be also

able to act on the absorbents ; and consequently it may be expected that caloric will stimulate the languid function of absorption, as it does that of capillary circulation. But, in whatever way we may account for the influence which caloric exerts on the function of absorption, the following experiment, and several others which I could relate, leave no doubt of the fact.

EXPERIMENT VIII.

A child had been many weeks in the Charitable Infirmary, on account of a very extensive burn, produced by its clothes taking flame while it attempted to drink from a kettle which was sitting on the fire. The granulations of the ulcers, which had resulted, were latterly very large, soft, pale, much disposed to bleed ; and with all the care of the dresser, could not be kept down by the ordinary means of treatment. When an ulcer, which was on the breast, was in the state described, I burned a Moxa over it, at such a distance as to excite the feeling of pain, without producing any disorganization. On the following morning, the effect was most remarkable : the granulations of the part, and beyond the part, to which the Moxa was applied, were sunk below the level of the surrounding skin, and might be almost said to form a little well which lodged the matter. This experiment I repeated on other parts of the ulcer, and for several days in succession, and always with the same result.

The relations which exist between the action of those medicines which are called local tonics or astringents, and those which are capable of exciting absorption, were noticed in a particular manner by Darwin ; who, conceiving that the influence of the former could be best explained by their action on the absorbent system, has classed them under the head *Sorbentia*. If this opinion of Darwin have

any foundation, which I think it has, it will afford an additional reason for expecting that those agents, which excite the capillary circulation to increase of action, will also excite the absorbents to a similar state; and, by parity of reasoning, we may conclude that those agents, which are capable of exciting the absorbents, will have a similar effect on the capillary circulation. Thus, digitalis, mercury, &c. &c. may have a double influence in some diseases: acting directly on the function of absorption, and indirectly on the capillary circulation; and have we not daily proofs of both modes of action in their powerful influence over certain forms of inflammation?*

From the experiments and observations which have been laid before the reader in the present section, I trust he will consider me entitled to conclude, that caloric applied under certain circumstances, and with certain restrictions, stimulates in a powerful manner the capillary vessels, causing them to act with more force, to contract their diameters, and to circulate their blood with greater velocity; and that, either by this action on the capillaries, or by a direct action on the lymphatics of the part, it has also the power of exciting in a remarkable manner the function of the absorbent vessels. And, further, that the beneficial influence of Moxa in curing or relieving disease must depend on its tonic action over the functions of absorption and capillary circulation, for it has been already shown that the other effects of this remedy are incapable of affording any explanation of its beneficial influence; for, on one hand, when the Moxa is properly applied, there is scarcely any inflammation excited; and,

* See "A Case of Inflammation of the Ear, &c." in the "Transactions of the College of Physicians in Ireland, Vol. II." in which Dr. GRATTAN has made some very interesting observations on the influence of mercury and digitalis in inflammatory diseases.

on the other hand, its beneficial influence occurs and has terminated long before a discharge is established.

From all that has been said, it therefore appears, that the action of Moxa on deep-seated disease, is precisely similar to that which is exerted by some of our most valuable agents on superficial disease ; and, therefore, that there can be no difficulty in accounting for its remarkable efficacy and the rapidity with which it accomplishes the relief of some of those affections, to which its therapeutic influence is suited. Moreover, it is evident, as caloric is the only agent which has the power of acting in this way, or at least with the same energy, on deep-seated disease, we cannot substitute any other remedy in its place. Hereafter I shall endeavour to show that there is a resemblance between the local or tonic action of heat, and the effects which arise from galvanism and acupuncture ; but these two latter agents exert an influence so vastly more transient and rapid, that their action holds with caloric much the same relation as the diffusible stimuli, alcohol, ammonia, &c. do with the more permanent effects of bark, iron, arsenic, &c. &c.

Holding in recollection that the Moxa acts on the capillaries and absorbents as a local tonic or stimulating astringent, energetic and continued in its influence, I shall now proceed to the consideration of the form or stage of disease suited to its action.

SECTION III.

OF THE SELECTION AND PREPARATION OF CASES FOR THE APPLICATION OF MOXA, &c.

“ While the vessels are under the strong action of their tonic contractility, there could not be worse practice than to administer stimulants.”

“ ELEMENTS of MEDICAL LOGIC, by Sir G. BLANE, Bart.” p. 123.

FROM the nature of the action which caloric exerts on the organic structure, when used as a therapeutical agent, it follows that the Moxa should be employed in those cases only, in which there exists a state of debility of the capillaries, a consequent retardation of their circulation, and a diminution of absorption; and that it must be injurious if employed in cases, where there is increased action or active inflammation.

I have known, on many occasions, striking proofs of the correct foundation of these conclusions. I have heard of, I shall not say, irretrievable mischief from the employment of Moxa in the state of increased action and acute inflammation; but, I shall say, I have often heard of much unnecessary pain having been produced, and considerable aggravation of those symptoms which it was meant to relieve. I will candidly admit, that misap-

plications of a similar kind occurred in my own practice, before I had formed a correct opinion respecting the mode of action of this powerful remedy. Having been taught to suppose that its therapeutic influence was analogous to that of a blister, I formerly employed it indiscriminately in those cases in which blisters are commonly applied; and it is not necessary to observe, after what has been said, that it must have often failed to produce the relief I intended. Indeed, it was the opposite results which occurred on different occasions, *apparently* similar, that led me to investigate the character of those cases in which it was beneficial, as compared with those in which it either failed or was injurious; and, by this investigation, I was first led to a just view of its mode of action.

Let me here remark again, and particularly impress on the reader, that, although the effects of Moxa are so universally compared to those of a blister, it can never be used upon such a principle. Certainly heat may be so applied as to excite, like blisters, vesication, and discharge, and cutaneous inflammation; but while it produces these effects on the skin, it will act on the deep-seated parts as a powerful stimulant, and thereby often cause, in cases to which blisters are peculiarly suited, more injury than it can do good.

The foregoing views, respecting the mode of action of Moxa, satisfactorily account for a circumstance observed in the practice of Larrey. On reading the cases detailed by this experienced Surgeon, it will be remarked that, on many occasions, the employment of Moxa was preceded by measures, more or less active, to overcome inflammatory action; while, on other occasions, no such preliminary steps were adopted; yet we are not told the cause of these peculiarities, and the reader is

consequently unable to afford himself any rule of conduct, by which he could determine the cases, in which such measures ought to be used, from those in which they are not necessary. But if he will, during his perusal of the interesting cases related by the Baron, hold in view the mode of reasoning which I have adopted, all will be clear and satisfactory.

Let it, therefore, be laid down as a principle not to be deviated from, that this remedy shall never be employed in cases of increased action, or of active inflammation, or even in cases of sub-acute inflammation; that is, when the acute inflammation is lapsing into the state of chronic action; and this principle should be implicitly adhered to, whether the active inflammation has attacked parts previously in a state of health, or has supervened on the state of passive inflammation.

I admit all the difficulty which exists in distinguishing, in certain cases, the state of acute from that of chronic inflammation: a difficulty which oftentimes, even in cases of superficial disease, requires all the powers of discrimination, which the most accurate observation of existing symptoms, joined with the closest investigation of the previous history of the case, can afford. Where is the surgeon who has not found it necessary to pause, in cases of inflammation of the eye, and ask himself the question, shall I now stop the use of my emollient and antiphlogistic remedies, and replace them by stimulants? or shall I for some time longer pursue the former? If the difficulty be so great, when the vessels, which are the actual seat of disease, are visible, it cannot be less when the Surgeon is deprived of that source of information. In fact in deep seated disease, as in superficial, a degree of doubt will frequently exist; but, in all such cases, the prudent Surgeon will, if he commits any error, err on the safe

side; and, whenever there exists a question, he will prefer the delay and inconvenience, which may result from the employment of remedies suited to lower increased action, although these remedies might probably have been dispensed with, to the possible risk of having recourse to a remedy which, from its injudicious employment, might be a cause of great aggravation of symptoms, unnecessary pain to the patient, and a much greater delay in bringing the case to a favourable termination, than if he had fallen into the opposite error.

It would not be compatible with the objects of this publication to investigate fully those circumstances, which will enable the practitioner to distinguish the cases of acute or active inflammation from those of passive inflammation, for these circumstances are common to the diseases here treated of, and to all others. At the same time it may be useful to mention, in a summary manner, the more particular points to which attention should be directed in the diseases under consideration, for the purpose of arriving at a correct diagnosis of these opposite states. These circumstances are, the date of disease, the habit and mode of living of the patient, the state of the general functions, and the character of the pain.

If the disease be recent, if the patient be young and plethoric, and if his mode of living be such as to dispose to general plethora, appearances would lead us to expect the existence of active inflammation, rather than the opposite state; which opinion would be further strengthened by the co-existence of general and continued febrile symptoms. Cases, however, so clearly marked will seldom occur; and it is in those which are less obvious, that we feel embarrassment. In the latter cases, I have generally regulated my conduct by the character of the pain. If this be constant, or if it only slightly remits,—if it be

much increased by pressure and aggravated at the moment of exertion, I uniformly act on the supposition that there is increased action. On the other hand, if the pain be completely intermittent, and although increased after exercise, if it be less severe or but little aggravated during the act of exertion, and alleviated or but little increased by pressure, I dispense with the employment of those measures which are calculated to lower action, and at once enter on the application of Moxa, either alone or in conjunction with the adjuvants which I shall hereafter mention.

It has been generally said that acute differs from chronic inflammation in being attended by an increased action of the larger arteries leading to the parts inflamed ; but it would be more correct to say, that the increased action of the larger arteries in acute inflammation is continued, and in chronic inflammation intermittent. It will, in fact, be found, that in acute inflammation, there is a permanently increased action of the larger vessels of the part, and that in chronic inflammation, the increased action of the same order of vessels is intermittent ; and, also, that in the state of active inflammation, the febrile symptoms are continued, while they are intermittent in the state of chronic inflammation.

It must be admitted that there is, in the state of active inflammation, at certain periods during the diurnal revolution, an exacerbation of symptoms, both local and general, which is more or less obvious, under different circumstances ; but neither this increased action of the vascular system, nor the constitutional symptoms which attend on it, completely subside, as they do in chronic inflammation. The diminution, which takes place in the symptoms of active inflammation, amounts, at the most, to a very imperfect remission. Whereas, in the state of chronic inflam-

mation, the intermission is often so complete, that a patient, who shall be in extreme torture, and whose vascular system shall be in a state of excessive action at one period of the day, shall, at intervals, be free from distress : these intervals or intermissions being more or less regular in their recurrence.

I would wish to impress on the reader, in the strongest manner, the distinction just laid down. He will find it of much importance in practice, in assisting him to draw a diagnosis between the opposite states of chronic and acute inflammation ; and, by close observation, he will find the principle applicable to every form and degree of disease, from a scratch or pimple on the skin, to a complete disorganization of the most vital parts.

There is one difficulty, however, which occurs in the application of this rule, arising from the frequent combination of the two states of active and passive inflammation. Thus, if a patient labours under disease of a joint, one part of the joint may be in the state of active inflammation, and another part in the state of passive inflammation ; or, in cases of consumption of the lungs, one tubercle may be in a state of active inflammation, and another in the state of passive inflammation. On such occasions, although the intermission may be perfect as far as relates to the chronic action, the state of active inflammation which exists, will prevent the occurrence of a general intermission. The history of each case will, however, for the most part, remove all misconception. It may also be remarked that the diagnosis is not, on these occasions, of so much importance, as the treatment must be of a compound nature, or calculated to meet, as far as possible, these opposite states.

When we reflect on the probable finite object of the increased action of the vascular system, which attends

local inflammation, both acute and chronic, and when we consider the exhausted state of parts in the chronic form of disease, we shall have a ready explanation of the intermittent increased action of the vascular system in these latter cases. It depends, in fact, on an incapability of the parts to support that permanent increased action, which is necessary to produce a cure. After a short struggle, the motive powers of the weakened vessels become exhausted, and they sink into a state of apparent quietude until they recover tone for a fresh rally. Those states of intermitting excitement of the general vascular system on the one hand, and of the part on the other, being often insufficient for the removal of disease, produce the states of hectic fever and local disorganization, which are the necessary attendants of the state of chronic inflammatory action.

It is obvious, that when the state of tone of either the system or part is insufficient to support those actions which are necessary for the restoration of health, and when the morbid actions in consequence assume the intermittent form, the essential object to hold in view is the restoration or improvement of general or local tone; but as our means of accomplishing these objects depend on the administration of remedies, which are essentially stimulant, the greatest judgment is required so to regulate the dose and period of administration, as will prevent them from adding to the original disease by exciting too much action, or by increasing the paroxysms of increased action, which result from the spontaneous efforts of the system or of the parts. If these opinions be correct, tonic medicines both local and general will be more suited to the case, according as it shall be more purely intermittent, and this is in fact what we observe in practice. These principles also explain the remarkable efficacy of general

tonics on many occasions; such, for example, as the influence of bark and arsenic in ague, and the influence of local tonics or astringents in removing discharges, when the action attendant on them becomes chronic or intermittent: and the same principles explain the powerful energy of Moxa as a local tonic.

But to return to my more immediate object. It is not necessary for me to enlarge on the means best suited to the end of reducing action in those cases in which it may be required. There are, however, some of these means, upon which I would wish to say a few words.

One of the most useful external remedies for the reduction of increased action in such cases as those under consideration, is the warm bath; but there is none more subject to abuse. The employment of this remedy requires a great degree of caution, for if its temperature be too low or too high, it will have an opposite effect to that intended. It should not, if applied as an antiphlogistic, be used on any account of a higher temperature than 97° F. nor lower than 80°. The patient should also remain in it much longer than is customary; never less, except some inconvenience is experienced, than forty minutes; and, in general, great advantage will be obtained from a much longer immersion.

Surgeons are well aware of the utility of evaporating lotions, as a means of subduing increased action, where the increased action is accompanied by a considerable elevation of temperature. The difficulty experienced in applying this remedy, so as to procure with certainty its good effects, is so much felt, both in hospital and in private practice, that it is used, perhaps, less frequently than under other circumstances it would. This difficulty consists in our not possessing the means of keeping up an equal and uninterrupted evaporation, even when the en-

tire attention of a nurse is devoted to the object. It would, in fact, require a greater degree of vigilance, than in common circumstances we can expect, to supply the part both day and night unintermittingly with a fluid of the proper temperature, and in the same quantity. Indeed, as it is commonly used, it, in general, does more harm than good. A cloth, wet with the lotion, is laid on the part; and, in nine cases out of ten, this cloth is so supplied with the lotion, that it will be found as often dry and hot as wet and cold. Very often the application of the lotion is suspended, more or less, during the night, and even when it is used with the greatest care, it is almost impossible to employ it with such accuracy that the part shall not feel any vicissitudes of temperature; and these vicissitudes having the effect of exciting action, there may be more mischief than good done by the application.

The foregoing considerations induced me, some time ago, to devise an instrument for the application of evaporating lotions, and I have succeeded in constructing one, which is remarkable for its simplicity and efficacy. By it, the lotion may be applied uninterruptedly, both day and night, of any temperature required; and without the assistance of any nurse-tender, except to set it going; after which it will continue to supply the part for many hours, without the least attention, with any quantity of fluid which may be necessary. This instrument is now used in the Charitable Infirmary, and great advantage is derived from it; not only because it affords the means of treating such cases as require evaporating lotions, with greater accuracy and care, but, also, from its causing a saving of expenditure in bed linen; for, as evaporating lotions are commonly applied, the beds become wetted from the superabundance of fluid which is poured on the part, for the purpose of keeping the cloths, with which it

is covered, wet as long as possible. This instrument supplies no more than the exact quantity of fluid which is carried off by evaporation; and, consequently, there is none allowed to pass on the bed linen.*

The composition of evaporating lotions must vary according to circumstances. If the regulation of temperature be alone required, water will answer our object. If the agency of a stimulant or astringent be necessary, either for the purpose of preventing the influx of fluids into the part and thus oppose inflammation, or to excite the languid state of the capillaries, the water should be impregnated with a greater or smaller proportion of alcohol, or of vinegar, or with preparations of lead, ammonia, &c. The impregnation with alcohol will increase the power of the water to reduce temperature, by rendering it more easy of evaporation. But alcohol will seldom be required for this purpose, as pure water applied by the instrument above alluded to, will preserve as low a temperature as can be ever wanting.

Without going into any physiological explanation of the fact, I believe it may be said, that active inflammation never occurs without an elevation of temperature in the part. It is rational, therefore, to conclude, that if we were possessed of the means of preventing an increase of heat of a part, we might with certainty prevent inflammatory action in that part. And although the propriety of carrying such a proceeding to a great extent might be doubted, when the inflammation arises from a peculiar state of the system, or in other words, when it is, as has been called, spontaneous,—there can be no doubt of its propriety, when the inflammation is the result of external injury. Of course, in cases of deep internal

* See the Plate which accompanies this Work.

inflammation, we cannot regulate the temperature of parts in which the disease may be seated, but we have full power over such parts as are superficial, and particularly over the extremities.

The employment of these lotions, however, requires great judgment. For if the inflammatory action has existed for some time, such a state of the vessels must have ensued as will require time and increase of action for their recovery. Therefore, if the employment of evaporating lotions, or any other means of reducing action, be employed in such a degree as to prevent those actions which are necessary to restore the parts, great delay in the recovery will be the consequence. Again, if a similar practice be adopted in spontaneous inflammations, metastasis or retrocession of the morbid action to some more vital organ may result.

Were it not deviating too much from the proper objects of this publication, I could adduce many cases in proof of the very remarkable efficacy of evaporating lotions, when assiduously applied, and properly modified according to the exigencies of each case. I shall, however, content myself with relating a single instance; and with observing, that since I constructed a proper instrument for the application of these lotions, I have been able to dispense with local bleeding in a great variety of injuries of the extremities, in which it would, under other circumstances, have been absolutely necessary.

CASE.

Thomas Daly, aged 74, a labourer in the employment of Mr. Walter Doolin, of Ormond-quay, builder, was admitted into the Charitable Infirmary, on the 7th day of May 1823. Immediately before his admission, he had fallen from the rafters of a new house to the ground

floor, having passed between the joists of three rooms, which were not floored. I found several of his ribs smashed, the trunk bruised in several parts, and the left femur fractured. The principal injury had, however, been inflicted on the left knee. The joint was not wounded externally; but, on grasping it with my hand, it felt as if it were a bag filled with small splinters of bone, or with small angular stones. In fact, the ends of the tibia, femur, and the patella, which form this joint, were shattered into innumerable fragments, and the leg was, in consequence, so loosely connected to the thigh that it could be moved in all directions—even in the direction of extension, abduction and adduction, so as to form nearly a right angle with the thigh.

A consultation was immediately held of the Surgeons of the Hospital and of others, at which Messrs. Wilmot, Kirby, Carmichael, Adams, &c., were present. It was decided that I should remove the limb. The operation was proposed, but the man refused; and from his age, and his situation in life, it was not urged. His age also forbade the abstraction of much blood, and, therefore, my only resource consisted in opposing inflammatory action by the assiduous and proper application of lotions.

The limb was put in an extended position, a small number of leeches were twice applied. The temperature of the knee was not allowed to rise above its natural standard. No untoward symptom whatever occurred, and on the 16th day of November, following his admission, he was discharged, able to walk extremely well with the assistance of a stick.

A few days ago, I visited this patient to ascertain his present state. He declared the limb was quite as useful to him as the other, and that he was able to pursue his daily labour. He used no stick, and could walk with firm-

ness. The joint was not more easily fatigued than that of the opposite limb, nor was it at any time affected with pain. The patella felt slightly moveable; and, when he walked, the femur appeared to move on the tibia as if the articulating surfaces of both bones were flat. He could stamp or press his foot with full force against the ground, and could bend the leg on the thigh to an angle of about 135 degrees. The appearance of the joint was not deformed, except by a small projecting bony knob, seated at the outer part of the joint, above the head of the fibula.

Another external mode of diminishing inflammatory action, in such cases as those under consideration, is the local abstraction of blood. I believe Surgeons are tolerably agreed, that in all cases which require local bleeding, if the disease be deep-seated, cupping should be preferred. I shall not stop to inquire on what its superiority depends, but I am quite certain that, in such cases, if executed in a satisfactory manner, it is preferable to leeches. It is, however, much to be regretted, that the operation in many instances fails; and the practitioner is often disappointed by hearing that the quantity of blood prescribed had not been obtained. This I am convinced arises, not merely from want of dexterity in the operator, but from the operation itself being essentially imperfect, as it is performed in this country, with the spring-scarificator.

Among the objections to this mode of performing the operation, it is scarcely fair to consider the bad state in which we generally find the scarificator; for this might, of course, be remedied by particular attention. At the same time, it must be admitted, that the difficulty of preserving the spring-scarificator in proper order, is a very considerable practical inconvenience. But there are other objections to this instrument, which are altogether in-

separable from it. Among these the following may be mentioned :—

1st. With the spring-scarificator, it is impossible to make every part of the incisions of equal depth. This arises from the manner in which the lancets enter and escape from the skin : from this cause, the beginning and end of the incisions must necessarily be less deep than the middle portion. Therefore, if we make the lancets cut only to the proper depth in the middle, the incisions at the beginning and end will not be deep enough ; and if they be deep enough at the beginning and end, they will be too deep in the middle.

2d. When we have occasion to perform the operation over any of the cavities, or on subjects whose flesh is soft and unresisting, in a vast number of such cases, the operator will find great difficulty in so apportioning his pressure to the yielding state of the subjacent parts, that his incisions shall be exactly as deep as he had calculated on, when setting the lancets of his scarificator. I have frequently observed this unsupported state of the skin to have such an influence that, when the instrument has been used, it has left scarcely the trace of an incision ; and, on other occasions, I have observed the operator, fearful of such an event, press with so much force, and make his lancets cut so deep, that his incisions have entered the adipose substance ; and this substance, protruding afterwards through the wound, in consequence of the suction of the glass, has rendered the operation nearly abortive.

3dly. The number of incisions, which can be made by the spring-scarificator at one application, are much too few, and also too short ; and the interval between them is, therefore, so great, that only a small portion of the surface inclosed in the glass is incised ; and consequently, the

blood can escape at a few parts only : hence an additional obstacle to our obtaining a sufficient quantity.

The foregoing considerations have induced me, for some time past, to prefer the following mode of performing the operation of cupping ; and since I have adopted it, I have never failed to obtain any quantity of blood required ; nor have I ever seen it fail in the hands of those pupils, who have adopted it by my directions.

In the first instance, let me observe, that for the purpose of exhausting the cupping glasses, the combustion of a few drops of any spirituous liquid on a little tow or lint, is the mode which I much prefer ; not only because it is more convenient, by enabling us to dispense with a number of instruments, but also because the degree of heat produced renders the circulation in the cutaneous capillaries more rapid ; and, consequently, facilitates the discharge of blood, when these vessels have been divided. A cupping glass having been thus exhausted and applied for some minutes to the part, as well for the purpose of determining to the skin, as to mark the extent of surface which should be scarified, with the assistance of a lancet-scarificator or gum-lancet, as it has been called, drawn lightly over the skin and with great rapidity, I traverse the surface as far as the mark formed by the edge of the glass, with superficial incisions, about the fourth of an inch distant from one another. These incisions should be so slight, as to be scarcely visible. The operator need not fear that they will not bleed, for the moment the cupping glass shall be applied, the blood will be found to stream from them with a rapidity which quite surprises those, who, for the first time, have seen the operation thus performed.

It is not possible, without comparing this operation with the one commonly practised to be sensible of its great superiority. From its description, the

reader may suppose that it is more tedious, and therefore more painful; but, I assure him, he would be surprised at the rapidity with which the lancet-scarificator may be made to traverse the surface; and that this operation is not so painful as that in common use, I have had innumerable opportunities of ascertaining, by leaving the kind of operation to the selection of the patient; for always, without exception, the lancet-scarificator has been preferred, after there has been an opportunity of comparing the two operations.

The structure of the integument explains the superiority of this mode of operating, and affords proper rules for its performance. The vascularity of the skin is so very different on the external and on the internal surface, that the former may be considered as one of the most vascular textures of the body, while the latter is one of the least vascular. The external surface is, in fact, clothed by a network of capillaries so extremely minute, and at the same time so infinite in their inosculation, that they can be compared to nothing, with so much accuracy, as to a beautiful fine web spread over the entire skin; and this web is so confined to its outer surface, that, if the skin be injected with vermilion and size, the exterior will appear as red as scarlet, and the interior as white as paper. Underneath this vascular web, the nerves are expanded, from which the sensibility of the skin, as an organ of touch, is derived.

When we reflect on the low vascularity of the internal surface of the skin, we must conclude, that no advantage can arise, in the operation of cupping, from its division; and when we consider that the nerves of the skin are expanded over its surface, beneath the capillary web, we should take care to make our incisions so very superficial, that they shall inflict as little injury as possible on this

nervous expansion. Both the foregoing considerations, therefore, authorize the practice of making our incisions extremely superficial. It may be asserted, that it is not practicable to cause the scarificator to traverse the skin so lightly, as not to cut through the nervous expansion. I am of a different opinion, because I cannot account for the trifling pain which patients experience from this operation, without supposing such to be the case: they always compare the pain of the wounds, inflicted by the lancet-scarificator, to that which is excited by drawing a pin over the surface. I think, moreover, the quantity of blood, which we shall obtain from the division of this capillary net-work, will be increased, if our incisions do not penetrate its whole thickness; for we know that a vessel, partially divided, will pour forth its contents more profusely than if its section has been complete.

The mode of cupping, which I have now described, is the one which is, I believe, generally adopted in the south of Europe; while in Germany, and in the North, a spring-scarificator, such as is used in these countries, is the instrument employed. I was formerly in the habit of using, as I have already mentioned, the common gum-lancet as a lancet-scarificator; but I have latterly adopted that form of instrument which is employed by the Baron Larrey, and of which I have given a drawing. This will be found to answer the purpose extremely well.

The simplicity to which the operation of cupping is thus reduced, is no trifling recommendation in its favour. The Surgeon can be at all times provided with his scarificator; and, if, on visiting a patient, he find the local abstraction of blood urgently called for, he can immediately proceed to the operation; for he can, in every situation in which he may be placed, obtain a vessel which will answer for a cupping glass, and also a small quantity of a

spirituous fluid, and this is all the apparatus that is necessary. Much and most valuable time may thus be frequently saved, which is often lost in hunting for leeches and for instruments, to the serious and probably irreparable injury of the patient.

On the subject of those remedies which are suited to the reduction of increased action, and which act on the general system, I have but little to say. In employing such remedies, we should carefully bear in mind that these diseases have all a tendency to pass to the intermittent or remittent form, and consequently, that they are more or less atonic. We should, therefore, be cautious in our employment of general evacuants, lest unnecessary debility ensue, and thus produce a fresh barrier to the removal of the disease. We should prefer those medicines, which lower action, without causing much loss of power. Among these digitalis, colchicum, mercury, and antimony, hold prominent places; and if they be judiciously employed, general depletory measures will be but little necessary.

Having, in this and the preceding sections, investigated the mode of action of Moxa, and the nature and stage of disease to which its employment is suited, I shall now proceed to lay down practical directions for its various forms of application.

SECTION IV.

OF THE VARIOUS MODES OF APPLYING MOXA.

“ Ne craignez rien de la résistance des malades, leurs douleurs sont si cruelles que la brûlure la plus active sera foible en comparaison.”

ŒUVRES POSTHUMES DE M. POUTEAU, TOME. I, p. 217.

VERY different substances have been used in different countries to cause Moxabustion : the Nomades employed, for this purpose, wool, as well as certain spongy substances growing upon oaks, and springing from the hazel—the Indian the pith of the reed, and flax, or hemp, impregnated with some combustible material—the Armenian the agaric of the oak—the Chinese and Japanese the down of the Artemisia—the Thessalian, dried moss—the Egyptian, Arracanese, and several oriental nations, cotton—the Ostiaks and Laplanders the agaric of the birch—and the Aborigines of North America, cotton and dried wood. At present, in France, Baron Percy prefers the medulla of the Helianthus Annuus or sun flower, and when this cannot be obtained, he recommends cotton impregnated with a saturated solution of the nitrate of potash; and Baron Larrey uses a cylinder formed of carded

cotton, unimpregnated and surrounded by a capsule of linen. The cause of such a vast variety of substances being employed by different people is easily explained, when we consider, that, in those countries in which Moxa is much employed and its value known, it has been the universal custom to attribute a portion of its medical efficacy to some peculiar volatile substance disengaged during its application.

It is not necessary to inform my reader, that caloric is the only agent evolved, during the combustion of these various substances, from which any therapeutic influence can be expected. We should select a substance, whose combustion will take place slowly, but steadily. If the combustion be too quick the effects will be too transitory, and if too slow it will require the use of the blow-pipe, which complicates the operation, and unnecessarily alarms the patient. I have been fortunate enough to discover a mode of forming Moxa, which is free from both objections : it burns slowly, but steadily, with the assistance of the blow-pipe if we please, without any sparks, without the least trouble to the Surgeon, and without alarm to the patient, for its combustion is scarcely observable. It is formed by immersing either Surgeon's lint or fine linen, in a filtered solution of chlorate of potash : the solution being made by dissolving one drachm of the salt in four ounces of distilled water. When the Moxa is to be used of a small size, fine linen will answer best, but when of a large size, lint is to be preferred. Care must be taken that the substance used shall be perfectly dry, before it be folded up, and in folding it, a proper degree of firmness must be given, which experience will soon teach. After the substance has been rolled up and fastened with two or three stitches of the needle, its end should be cut with a very sharp

knife, to make it perfectly level, and thus secure its application to every part of the skin upon which it is placed. Its length should be about three-fourths of an inch, and its diameter may vary from one quarter of an inch to an inch.

The instruments which I use in applying the Moxa are of the most simple kind : a *porte-aiguille*, which I have invented, (see Plate) or a pair of dressing or artery forceps, furnished with a screw at about three-fourths of an inch distant from their point, which screw serves to press the blades of the forceps very tightly together ;—a bit of small, flat, silver wire, about three inches in length ;—a bit of card paper ;—a blow-pipe ; a set of needles ; and a small glass tube, are all that are required. With the silver wire a small hoop is formed to grasp the Moxa : the size of the hoop being made to vary according to the size of the Moxa ; and the ends of the hoop are grasped in the forceps, which are made tight on it by the screw with which they are furnished. The hoop should be applied about a line distant from that end of the Moxa which is to be placed on the skin ; for the purpose of preventing any inconvenience from the hot wire coming in contact with the surface. In fixing the ends of the hoop in the forceps, such an angle or inclination of the Moxa with the forceps should be given, as will be found most convenient for the exact application of the Moxa to the part affected.

The Moxa should be applied in painful affections to the point where the greatest distress is felt, if it be possible so to do ; and in paralytic affections, it should be first applied over the origin of the nerves which lead to the diseased parts, and afterwards along the same nerves in different parts of their course. Those continental Surgeons, who have given directions respecting the application of the Moxa, have spoken in a particular manner of the

parts to which it is proper to apply it, and of the parts to which it should not be applied. On this subject, it is not, in my opinion, necessary to enlarge. In these countries no one will use it, unless such as are acquainted with the anatomy of the parts upon which they are operating; and to them it is unnecessary to say any thing. Moreover, as will just now appear, there is scarcely a part of the body, to which it may not be applied in one form or another: even to the eye it may be applied in the form of the objective Moxa, as I have often done, with great advantage, in some cases of obstinate chronic ophthalmia.

The size of the Moxa, the manner in which it should be applied, and the length of time it should be allowed to remain on the part, are points of some importance.—All these circumstances must be regulated by the depth of the disease, and the nature of the parts, to which we may wish to apply it. It may be used, so as not to cause any injury of texture; in a greater degree so as to produce vesication; and in a still greater degree an eschar, and the eschar may be either deep or superficial; or, lastly, it may be employed in conjunction with the acupuncture needle. These different modes of using the Moxa may be distinguished by the terms, first, second, third, fourth, and fifth, forms of application.

The first form of application will answer when the disease is very superficial. It constitutes the objective cautery of the French writers, and is highly extolled by *Faure* in the *Mémoires de l'Académie Royale De Chirurgie*, Tome 15. 12mo, as a powerful remedy for the cure of ulcers. It may be serviceable in neuralgia, when the nerve is very superficial; or in affections of the joints, when the synovial membrane is immediately under the integuments, as is the case in the knee and wrist. When used, it should be repeated at least once a day, and applied

by holding the Moxa in the forceps, as close to the part as the patient can comfortably bear; at the same time it should be moved slowly over the surface, backwards and forwards, until its combustion has terminated.

I seldom have recourse to the second form of application, because it is not so effectual as the third, and it is more troublesome in its after treatment. It may, however, be usefully employed in Tic Douloureux, and to those parts, on which the patient would not wish a cicatrix to be formed. In such cases the Moxa is applied by holding it steadily, and as close as possible to the skin, without allowing it to touch it, and until the skin appears white; which appearance is owing to the detachment of the cuticle, and the formation of a blister.

In a large proportion of cases the superficial eschar will be the best form of application. To produce this eschar, the Moxa must be placed on the skin, and allowed to remain on, until the skin appears brown under it; which will, in general, be found to take place, when the combustion of the Moxa has extended to the distance of about a line from the skin.

The deep eschar will be required, when the seat of the disease is far removed from the surface, as in affections of the spinal marrow and of the hip. To form this eschar the Moxa must be allowed to remain on, until its combustion is complete; when the part upon which it was seated will be found black, and the surrounding skin slightly red, and wrinkled. In this form of application, it will be sometimes useful to encrease the intensity of the heat by the employment of the blow-pipe; and when this is thought prudent, the Moxa should be, previously to its application, surrounded by a cylinder of card-paper, which will have the effect of directing the current of heat downwards, and prevent its escape laterally.

When our object is to obtain any of the effects last described, it will be advisable, previously to the application of the Moxa, to mark the spot on which we may wish to place it, with a little circle of ink; and in case of using the blow-pipe, we should cover the surrounding parts, with a piece of paper, having a hole in its centre for the Moxa : the paper having been previously wet in a saturated solution of the sulphate of alum, or muriate of soda, and afterwards dried. These solutions diminish so much the combustibility of the paper that it will prevent it from taking fire, in case a spark should be driven off by the blow-pipe.

On several occasions, as for example in paralysis, and some obstinate forms of sciatica, the frequent repetition of the Moxa will be required, before the disease is subdued; and the disease is so far removed from the surface, that, to act on it, an eschar must be produced. When the eschars are thrown off ulcers are formed, and where they are very numerous, they cause considerable irritation to the patient, and the discharge produced by them may be more than is suited to the weak state of his system. In these cases the application of the Moxa, in conjunction with the needle, will be found a most excellent mode of using the remedy.

When the Moxa and acupuncture needle are used in conjunction, the following is the mode of operating.—I perforate a Moxa of a proper size by a needle, of such a length, as will be sufficient to reach to the seat of disease, and at the same time extend so far beyond the surface of the skin, as to keep the Moxa about one inch from it, or so far as to secure the texture of the skin from injury. The needle is then introduced as far as the seat of disease, by the assistance of the *Port-aiguille*; and, as soon as it has been introduced, the *Port-aiguille* is

removed, the needle being left in the part. The Moxa, which had been previously perforated, should be now placed in a state of combustion on that end of the needle, which projects beyond the surface of the skin, and allowed to burn round the needle by which it is thus transfixed. The heat disengaged from the Moxa is communicated to the needle, and thence conveyed to the seat of disease. When the needle has cooled it is removed, and the wound or eschar produced by it is scarcely observable. I have also employed, with remarkable efficacy, the preceding mode of using the Moxa, in cases which required the intense application of this remedy; but in which the texture of the skin could not be injured, nor an eschar, with propriety, formed.

It is recommended by Larrey, that immediately after the application of the Moxa, the skin should be wet with the water of ammonia, and this for the express purpose of preventing the occurrence of inflammation: the very effect, which those who do not understand the mode of action of Moxa, are desirous of producing!! Upon what principle the Baron expected such a result from the application of ammonia, I know not, for he has not made any remark upon the mode of action of this application. Its effects are, however, such as he states, and clearly explicable, as will hereafter be proved, on sound physiological ground. It, will, however, answer the same purpose to apply any other powerful stimulus. Alcohol, æther, turpentine, or ammonia, may be indiscriminately used; or even bruised garlic, which Ten Rhyne recommends in his work *de Arthritide*. The neatest mode of applying the water of ammonia, alcohol, &c. is by a glass tube. The fluid ascends in the tube, as soon as it is placed in the bottle containing it. The operator should then put his thumb on the end of the tube,

while he lifts it from the bottle, and thus retains in the tube a sufficient quantity of the fluid, which he can then allow to drop on the surface of the skin as he pleases. I may here mention, that I have found tubes of this kind extremely useful, for the purpose of dropping fluids into the eye.

In the first and last modes of applying the Moxa, no after treatment is required, farther than the temporary application of the stimulants just mentioned. When eschars are produced by the application of the Moxa, the part should be kept covered by a piece of adhesive plaister, until the eschars are separated. This separation will generally take place in the course of eight or ten days, but sometimes not for double this period ; and it is remarkable, that the Moxa acts more favourably in those cases, in which the eschar is thrown off very slowly, than in those in which its separation takes place with rapidity : the reason of this will appear hereafter. The superficial ulcers, which result from the separation of the eschar, as also the excoriation, which follows the vesication produced by the second mode of applying the Moxa, should be washed once or twice a day, until they are healed, with a solution of the nitrate of silver or sulphate of copper, and covered by adhesive plaister. The ulcers left by the separation of the eschars will always be found much less deep than might have been expected, but greater in their superficial extent than would be supposed from the appearance of the eschar ; and they will, therefore, in general, require some days for their cicatrization.

SECTION V.

OF THE MEANS WHICH MAY BE EMPLOYED AS ADJUVANTS TO MOXA.

This “is all that is requisite for a cure ; which is true, as I have experimentally proved, by using no other, in cases which have succeeded perfectly : but this fact being established, there is no reason why every assistant means should not be applied at the same time, in order to expedite : such as bark, cold-bathing, frictions, &c.”

POTT'S WORKS BY EARL, Vol. iii. p. 250.

Having discussed, in the preceding sections, the mode of action of Moxa, the manner in which it should be applied, and the general principles which should regulate us in selecting and preparing cases for its application,—I propose to consider now, whether any additional means should be used along with it, of what kind they should be, and upon what grounds they ought to be employed.

It does not require any argument to prove that, if we have means which can co-operate with the action of Moxa, they should be employed in conjunction with it. Nor does the utility, or even the necessity, of collateral remedies, militate in the slightest degree against the independent and powerful therapeutic influence of Moxa. What is the agent employed in the practice of medicine or surgery, in respect to which, we do not act upon the same principle ? Indeed, the means used by us in the

treatment of disease are, almost uniformly, remarkable for their complexity; and probably this has been one of the reasons of the slow advancement of our knowledge of remedies; for, where many are used in conjunction, it is impossible to distinguish the effects of one from those of another; and until our knowledge of a remedy is so far advanced, as to enable us to select with judgment those means which are suited to co-operate, it should be employed alone; otherwise, we shall be in danger of uniting it with remedies which may be not only useless, but injurious, by opposing its action. But, when the mode of operation of a remedy has been fully and carefully ascertained, and its utility proved by its insulated and repeated application, "there is no reason why every assistant means should not be applied at the same time, in order to expedite."

I have not to speak in this place of the application of those means, which ought to be employed for the removal of the remote causes, that may have produced those states of the vascular system upon which the disease depends; my object is confined to the consideration of the remedies, which may tend to co-operate with Moxa in restoring the vessels of the part to a natural state: it being understood that when the Moxa is indicated, these vessels are weakened, and probably distended. The reader will not, however, suppose, from my silence respecting the causes of these diseases, that I consider attention to them a subordinate object. On the contrary, without a constant regard to the removal of their cause, no system of treatment can be effectual; and this is true, whether the disease arises from a morbid state of any other organ in the system, or from the undue operation of any of the numerous physical or moral agents, which possess the power of influencing our body, and thereby of exciting disease.

As the essential nature of those diseases, which are suited to the action of the Moxa, consists in an atony, and often in an overloaded state of the absorbents and capillaries, the remedies, capable of being employed as adjuvants to the Moxa, may be considered under two divisions: 1st, Those which act by directly increasing the tone of the vessels, and consequently the rapidity of absorption and capillary circulation;—and 2dly, Those whose beneficial influence depends on their emptying the overloaded or distended capillaries. The former are denominated tonics, and the latter evacuants. The tonics are either general or partial in their mode of action, while the evacuants are either absolute or relative. The signification of these terms will be explained in the sequel.

It has been correctly remarked by those who have treated of the action of remedies, that tonics may differ very much in their mode of operation. Thus venesection, purgation, or whatever will, under certain conditions of the body, occasion a salutary change in its vital powers, may produce a corresponding alteration in the tension of its fibres, and consequently fall under the denomination of a tonic remedy: but independently of the state of the body, there would seem to be certain substances which act as specific stimuli on the living fibre, and are, in certain cases, by their stimulant operation, capable of increasing its tone or motive power. It is of the latter class of tonics that I wish more particularly to speak; and the reader is always to hold in recollection that I employ the word tonic to designate all stimulants which are capable of exciting actions, favourable to the acquisition of power. Their action is not, however, confined to their operation on the sanguinary capillaries, for they materially excite the lymphatics and function of absorption; and the reasoning and observations made at page 44, &c. respecting

the relations of these two orders of vessels, are fully applicable on the present occasion.

In general, such tonics as are derived from the mineral kingdom should be preferred to vegetable tonics: at least in the more chronic forms of the disease under consideration. The only vegetable tonics, upon which I would place any reliance, are cinchona, guaiacum, and turpentine; and the mineral tonics, from which I have obtained most benefit, are mercury, iron, arsenic, silver, and copper. Upon what the superiority of mineral tonics depends, I cannot take upon me to say—but it is probably connected with the more permanent nature of their action; and as there is reason for supposing that they are absorbed with more certainty into the general circulation than vegetable tonics, it is also probable they may act directly on the part affected.

I am sorry that I do not feel myself capable of giving more precise directions respecting the selection of these remedies: it is likely, when our knowledge of their mode of operation is better understood, as also the exact nature of the diseased actions to which they are applicable, that peculiar forms of disease shall be found to require peculiar tonic remedies; but I am afraid our knowledge on the subject is at present so imperfect, that we must rest satisfied with the general principle; and, in its detailed application, be content, for the present, with the suggestions of empiricism. At least, I have not had, on many occasions, any better rule to guide me, than that of having recourse to one remedy, when another failed.

The proper regulation of the dose of tonic remedies is a most important point in their administration. We should reflect, that the state of the system, which renders their employment necessary, also renders it less capable of being influenced by stimulants; and that we may,

therefore, give with propriety, in such cases, larger doses of tonics, than their action on the body in the state of health would appear to justify. Indeed, it is probable, that we may extend to all remedies of this class, the observation which Cullen has made on one of them, viz.: "that the good effects of the preparations of iron have been often missed, by their being given into too small doses;" an observation which has been fully supported, and remarkably illustrated by Mr. Hutchinson and others, in the success obtained by them from very large doses of this tonic in that form of neuralgia, denominated *Tic Douloureux*. At the same time, it is to be remembered, that, as the action of all tonics is stimulant, their dose must not be excessive, otherwise they will produce a degree of excitement, which must be necessarily followed by a corresponding exhaustion or collapse; and they may thus aggravate, rather than alleviate, the state of weakness, for the removal of which they have been administered. To prove this fact, I need only adduce mercury, which, administered, in what are called alterative doses, forms one of the most universal and most powerful tonics we enjoy; but if its employment be carried to excess, there is no remedy capable of causing a greater degree of exhaustion and permanent weakness.

Nor is the length of time, during which tonics ought to be employed, a matter of less serious consideration than their dose. Therefore, while we bear in mind, that as they are stimulants, if their administration be continued too long, it may at length diminish the power of the system, we should remember, that the want of tone which exists, renders the fibre so much less sensible to their action, that some considerable time may elapse before their full influence can be obtained. When it has been necessary to persevere in their employment for a con-

siderable period, I have found great advantage from alternating their administration with one another; and, when the system is with difficulty acted on by them, their combination with stimuli of more transient action, particularly with opium, stramonium, lactucarium, hyoscyamus, and the carbonate of ammonia, will afford important assistance, not only by rendering the body more susceptible of their influence, but also in preventing any inconvenience from the administration of the large doses, which may be on such occasions required.

It is highly probable, that a well-conducted set of experiments, to ascertain the exact nature of the direct or local action of tonics on the animal texture, would afford us much assistance in arriving at correct views of the mode of operation of these important remedies upon the general system. Such experiments should not, however, be conducted, as Dr. Crawford did, on the dead fibre,* but on living texture; for we must ever bear in recollection, "*In vivum corpus agunt medicamenta.*" I am even of opinion, that the facts which have been ascertained by experiment in our own days, respecting the influence of stimulants on the capillary vessels, although these experiments were made with a very different object, are highly calculated to assist us in such investigations. Nor can I avoid remarking here the correspondence, which will be found, between the rules just laid down for the employment of tonics, and the conclusions which may be deduced from these experiments.

Although these experiments may not be considered by some readers as affording any support to the particular rules respecting general tonics, it must be admitted, that they may

* AN EXPERIMENTAL ENQUIRY into the EFFECTS of TONICS, &c. by the late ADAIR CRAWFORD, M.D. F.R.S. LONDON, 1816.

be capable of illustrating the influence of local remedies of this class. Therefore, as an introduction to the remarks which I am about to make on the latter agents, I shall relate in this place a few axioms, which appear to result from the experiments alluded to.

1. If an agent, which, on its first application, causes contraction of the capillaries and an acceleration of the motion of the blood in them, be applied without intermission for a lengthened period, it will cause a dilatation and retardation of the circulation: hence the impropriety of persisting in the employment of tonic remedies for an inordinate period.*

2. If a fresh stimulus be applied to capillaries, which have become dilated from continued excitement and consequent exhaustion, a contraction will ensue, and their natural state will be restored: hence, the advantages of alternating the use of tonics with each other, when their long continued influence is required.†

3. A stimulus, which is capable of producing contraction of the capillaries, will, if applied in a very concentrated state, immediately cause dilatation of these vessels and consequent retardation of their circulation, without any perceptible previous contraction: hence, the impropriety of administering tonics in too large doses.‡

4. When the capillaries are morbidly dilated, and their circulation retarded, they cannot be excited to contraction, until the stimulus has been a long time applied; and they will bear it for a long period, without its producing dilatation: hence, the necessity of taking care that the doses of tonic remedies are sufficient, and continued for a sufficient length of time.§

* HASTINGS, loc. cit. pp. 31, 79, 82. † Ib. pp. 83, 92. ‡ Ib. p. 91. § Ib. p. 90, and A. P. W. PHILIP, loc. cit. p. 15.

As I have already observed, local tonics, like general tonics, are, essentially, stimulants; and produce their influence on the functions of capillary circulation and absorption, by causing a degree of increased action favourable to the acquisition of power. The local tonics, which may be made to co-operate with the Moxa are divisible into those that act directly on the immediate seat of disease, and those that influence it by their action on the skin over the diseased part. To the former belong acupuncture, and probably galvanism, and to the latter the alternate aspersion of hot and cold water, terebrinthinate and ammoniacal liniments, and some other cutaneous stimulants.

The acupuncture certainly acts upon the principle of a stimulant; but, whether this be owing to its mechanical influence, or to the disengagement of a minute portion of galvanic fluid, I cannot pretend to say. If it be the fact, (as, if my memory does not fail me, I have read asserted lately in some foreign journal,) that needles made of platina have not the power of exciting, when introduced, any galvanic influence, and yet that they afford the same relief as those which are said to have this power, we must conclude that the benefit afforded by acupuncture, in such instances, arises from mechanical agency; at least we do not know any other way in which it can act. The acupuncture is a remedy that is gaining reputation on the continent; and, although it is not without its inconveniencies and rather transitory in its effects, yet if employed as an adjuvant, in the intervals of the application of Moxa, it will not be without its utility. The effect which it sometimes has in removing, for a time, all pain and uneasiness is very remarkable.

I have already spoken of a mode, which I have adopted, of combining the operation of acupuncture and Moxa,

by using a needle to convey the caloric, disengaged by the Moxa, to the more deep seated parts. The acupuncture may also be used in conjunction with galvanism; and this will often be found the most useful mode of applying the latter agent. The stimulating or tonic power of galvanism is so transient in its influence, that the number of cases in which it will be really efficacious, are very few: it may, however, occasionally deserve to be employed, and in paralytic affections, rather than in painful diseases.

The identity of galvanism and nervous influence, and the consequent power of the former to supply the place of the latter, has been of late years much insisted on by Dr. W. Philip. But although it should be admitted that there is a perfect identity between the galvanic fluid and nervous influence, yet, if galvanism acts merely by supplying a fluid, which serves the same purpose as the nervous influence, it is quite evident that its beneficial effects must be only transient, or just so long as it is applied: for the moment its application ceases, its effects must cease. Exactly in the same way, the influence of the brain over every part must cease, as soon as this organ ceases to act; or as soon as its power of influencing other parts is interrupted by the division or destruction of the nerves, which were the means of propagating its action. From these considerations it is, therefore, evident, that if galvanism has any permanently good effect, it must be by its action on that function, from whence the nervous influence is ultimately derived; and this function most certainly is that one by which the structure of the brain and nerves is formed and supported; or in other words, the function of nutrition.

It has been satisfactorily ascertained, that, of the various agents by means of which we can excite the capil-

lary vessels to increased contraction, there are none more effectual than turpentine, ammonia, ice, or hot and cold water. Turpentine and ammonia are frequently applied to the skin in the form of liniment for the relief of painful diseases. But the effects which they produce, when thus used, are the very opposite of a stimulating tonic. It has been observed above, that the long continued application of a stimulus to the capillaries, will excite dilatation of these vessels. From the manner in which ammoniacal and terebrinthinate liniments are applied, they must necessarily cause this effect; and, in consequence, there must result an accumulation of blood in the cutaneous capillaries, and a revulsion from the deep seated parts. I do not say these effects will not be useful, for I know the reverse to be the case; but it is right to be aware of the difference of results, which may be obtained from these remedies, according to the manner in which they are applied. If it be our wish to use them as tonics, or to cause the primary effects of a stimulant, their application must be transient; they must be applied in as concentrated a state as possible, and their influence promoted by alternating their application with one another.

The observations, which I have just made on the employment of turpentine and ammonia, are fully applicable to the remedy afforded by the aspersion of hot or cold water. The first effect of the impression of these agents will be to excite contraction of the capillaries, and consequent tonic action; but, if their application be continued beyond a certain time, relaxation ensues. When hot or cold water are used as stimulants, the former should be applied as warm as the person can bear, and when the latter is used, the coldest water should be preferred. I have, on many occasions, derived the most striking advantages from the alternate aspersion of hot and cold water,

in cases in which there was every reason to suppose the existence of a great degree of atony of the capillaries.—When the practitioner has not any means within his reach of propelling the water with force on the part affected, he may substitute for aspersion the simple alternate application of two large sponges—one being made as hot as possible and the other as cold. From this simple remedy he will, in many cases, obtain for his patient very unexpected relief.

A knowledge of the fact that an alternation of stimulants will produce an action more decidedly tonic, than the continuance of the same stimulant, induced me to try some years ago the influence of causing a shower of cold water to fall on the patient, immediately on his coming from the fumigating apparatus, and while his skin was in a state of great excitement. I knew from the practices, which are adopted in the north of Europe, that the trial could be made with safety. Highly beneficial results followed the experiment; and ever since, whenever I can overcome the prejudice of the patient, I have recourse to this system of conduct. When it is employed, I direct that the patient shall not remain more than half a minute under the shower, and that his skin shall be well dried and rubbed for some time after. The entire of this process is remarkably refreshing to a patient on coming from the hot apparatus. It is always followed by a most comfortable glow of heat, and I have no doubt of its assisting to preserve the patient from catching cold after the operation of fumigation.

The success which followed the preceding plan, led me to another, from which there has resulted advantages not less striking. It consists in applying cold to the affected part, while the general surface is still exposed to heat. This may be done, if it is a fluid bath which is employed,

by pumping a shower of water on the part ; or if it be a fumigation which is used, the cold may be applied by means of a bladder filled with ice or iced water. The value of this mode of proceeding has been frequently proved by its utility in some of the most obstinate cases of painful affections, which have occurred to me. When employed, it must be persevered in with steadiness and frequently repeated.

It has been asserted above, that those remedies which operate by emptying the loaded and distended capillaries, are either absolute or relative in their mode of action.—Thus, a preternatural accumulation of fluids in any part of the body may be removed by equalizing the circulation, without causing any discharge from the system ; and in such a case there is a relative diminution of blood in the part. Or, the local accumulation may be removed by causing a discharge from the part, in which the accumulation is seated, or from some of the remote parts of the body ; and in this case the diminution of fluids is positive.

The removal of preternatural accumulations of blood, by discharge from the part or system, is more particularly applicable to the treatment of that stage of which I have spoken, when considering the mode of preparing the patient for the employment of Moxa. I do not, therefore, intend to say any thing further of such remedies in this place. Let me, however, take this opportunity of apprizing the reader, that whatever may be the form of remedy employed, or the state or stage of disease in which it is used, we must uniformly hold in view the just regulation of all the secretions and excretions ;—and we must also bear in mind that it is no unusual thing for the state of increased action to supervene, while the patient is under the employment of tonic remedies ; and, in such an event, the mode of diminishing the contents of the vessels

which are the seat of disease, upon the principle of positive evacuation, must be employed.

When we diminish the quantity of blood in one part, by causing an increased quantity in another part, the therapeutic operation is denominated revulsion, or counter-irritation : an operation which is founded on the well-known relations existing between the different parts of the vascular system. These relations are, in fact, such, that we every day observe, both in the healthy and morbid states of the system, partial accumulations of blood in one part, accompanied by a corresponding diminution in another. Thus, in the act of digestion, the stomach receives an unusual supply of blood ; in deep and long-continued reflection, the brain becomes the seat of an analogous accumulation ; in the act of blushing, in the state of excitement of the organs of generation, and during utero-gestation, we observe a similar principle in operation. All these are examples of accumulations of blood compatible with the healthy state of the system. In disease, similar accumulations are much more frequent.—Thus the cessation of a morbid action in one part is frequently followed or accompanied by the origin of a preternatural action in another part, which phenomena, when they occur, afford examples of what are called the metastasis and conversion of disease. On other occasions, accumulations take place from the morbid actions of one part, without producing any other alteration in the remainder of the system, except a sensible diminution of blood in other parts, marked by a reduction of temperature. Thus we have coldness of the feet in diseases of the head, &c. &c.

Were we possessed of any means, by which we could, with certainty and at our pleasure, call into action, or controul this quality of the vascular system, it is proba-

ble that our power over disease would be infinitely greater than it is. For when we are able to act on disease by counter-irritation, we obtain from it great assistance in controlling morbid action ; but, unfortunately, our capabilities in this respect are often very limited.

From the universal sympathy which the skin holds with all other parts, from the little inconvenience which arises from an accumulation of blood in it, and from the facility with which we can act upon it by counter-irritants, it is, generally speaking, the organ to which we determine the blood, when we call to our assistance the operation of revulsion.

In applying agents to the skin, for the purpose of exciting in it an accumulation of blood, we sometimes act on the entire surface, sometimes on the part which is over the disease, and sometimes on a part which, though at a distance from the diseased organ, is supposed to have a remarkable sympathy with it. Among those remedies, which act on the general surface, we may class hot baths, fumigations, &c. ; both of which may be simple or medicated ; that is, the hot bath may be composed of water only, and the fumigation of heated air only, or these fluids may be impregnated with various stimulating agents.

Of those which act on a limited portion of the skin, we may mention the *vapour douche*, dry cupping, the long-continued application of irritating embrocations, liniments, &c. ; to which may be added blisters, scarifications, leeches, and those means which excite artificial eruptions, although all the latter act both as evacuants and counter-irritants.

It may, on a first view, appear extraordinary that I should speak of blisters as a remedy in those diseases which require the employment of Moxa, after having ob-

served, in many parts of the preceding pages, that mischief would almost inevitably arise if the operator used Moxa upon the principle of a blister. The reader will, therefore, please to reflect, that the application of blisters in cases suited to Moxa, is very different from the application of Moxa in cases suited to blisters; for it has been proved, in the preceding pages, that the mode of action of Moxa is that of a powerfully stimulating tonic, and that its effects extend far beyond the part to which it is directly applied; hence, it is quite evident, that if it be used in cases in which there is deep-seated increased action, it will increase the disease by increasing the action.—Whereas, the influence of a blister is almost entirely limited to the skin; and, by its operation as a counter-irritant, it may relieve deep disease, although the disease for which it is employed, be in a state of increased action. It is also evident, that blisters may be useful in those diseases, in which the capillaries are in a state of distention, by emptying the capillaries, although such blisters will not increase the tone of the weakened vessels.

The immediate relief, which we obtain from the entire class of counter-irritants, must have always struck those who have witnessed their employment in diseases to which they were suited. The temporary nature of this relief, when the diseased vessels are in a state of atony, is not less remarkable. In fact, this is exactly what might be expected from their mode of action. They, for a time, diminish the contents of the distended vessels; relief consequently arises. But as soon as the cause of revulsion is removed, the fluids again return to the weakened vessels. To render such remedies efficient, their employment must be frequently repeated, or even uninterruptedly continued, and accompanied by means calculated to restore the weakened capillaries to a state of healthy tone.

I almost uniformly combine with the Moxa the employment of general counter-irritants, or of such counter-irritants as act on the general surface ; and, of this class of remedies, I much prefer fumigations of heated air combined with stimulating vapours, such as sulphureous acid gas, ammonia, chlorine, &c. This class of remedies has always appeared to me to act with extreme benefit ; and from close observation, I have been induced to suppose, that they have a double mode of action, which renders them particularly suited to the atonic stage of many diseases. Their heat, and the stimulating substances with which the air is impregnated, evidently produce a remarkable determination to the skin, which is, in fact, sometimes rendered as red as scarlet cloth ; but, I am convinced, that in conjunction with this, they cause a contraction of the capillaries of the surface, a consequent increase of tone, which is propagated more or less to the rest of the system ; and, therefore, to the vessels which are the seat of disease. In short these remedies act so beneficially, that, in many cases, they would be alone sufficient to produce a cure. My reasons in support of the opinion which I gave six years ago, respecting sulphur fumigation, are, therefore, greatly strengthened : but the reader, who may have perused my publication on that subject, will observe that farther experience has led me to more general and more scientific views.

Those operations, which are capable of emptying the diseased vessels by pressure, however this pressure may be effected, constitute an important mode of relief in all diseases connected with a debilitated and distended state of the capillaries. The means of employing this pressure are bandage, friction, and percussion. It is probable that the two first operations may act as stimulants, and be, therefore, inadmissible in the state of increased action, or active inflammation : an observation which did not

escape the attention of the elegant and accurate Celsus, “*Nam et capitis longos dolores ipsius frictio levat ; non in impetu tamen doloris.*” &c.*

There are few things better ascertained in pathology and physiology, than the utility of pressure in disease, and the necessity of its constant agency in health. The syncope which so frequently follows the sudden abstraction of blood, the sinking sensations which result after the operation of tapping or parturition, death which has taken place, according to the observation of Sir G. Blane, after the copious evacuation of urine and fæces, are all to be explained upon the principle of internal pressure being suddenly removed ; while Saussure and others have made us acquainted with the inconveniences which follow from the diminution of atmospheric pressure.

On the other hand, the advantages which have been derived in the practice of our art, from the proper application of artificial pressure, are generally known and fully appreciated. It is thus, that we explain the success of Mr. Baynton’s plan of treating ulcers, Sir G. Blane’s in chronic hydrocephalus, Dr. Balfour’s in rheumatism, and Mr. Grosvenor’s in stiff joints ; and, upon the same principle, we may account for the advantage obtained from the practice of girding the loins on occasions of great muscular exertion, and the removal or diminution of the sensation of hunger by pressure on the stomach, as is remarkably exemplified in Captain Inglefield’s narrative of his escape from the Centaur of 74 guns, which foundered in the Atlantic Ocean, in the year 1782.

From the foregoing facts, it is extremely probable, that pressure may exercise a beneficial influence on parts, which are in a state of atony, independently of its effects in

* “A. C. CELSUS de MEDICINA &c. ex recensione L. TARGAE, EDINBURGI 1809.” Lib. ii. Sec. xiv. p. 77.

expelling the contents of the capillaries ; and even independantly of the power which it may give these vessels to resist the entrance of a fresh incursion of blood. Its mode of operation, in such cases, I cannot pretend to explain. We know that a degree of permanent tension, among organic fibres, is absolutely necessary for the continuance of their vital actions. For, as has been well remarked by Sir G. Blane, there is not any character of life more expressive of its nature than the universal state of tension of every fibre ; nor is there any more certain token of the extinction of life than the absence of all tension. No muscle, whether voluntary or involuntary, can exert its contractility, unless the fibres are previously in such a state, that, if divided, they would shrink by their resiliency, leaving an interval between their cut extremities. The same may be said of the vascular system in all its ramifications, in order to give play to their contraction in grasping and propelling their contained fluids. If that state of parts, upon which this tension depends, does not exist in its natural degree, and that tension can be communicated by such mechanical contrivances as bandages, adhesive straps, &c. we can have no difficulty in conceiving the utility of such contrivances ; for, by producing even a temporary increase in the state of tension, they may put the parts in a better condition for recovering their inherent or natural tone ; just as tonic remedies, both local and general, improve the tone of the system, or of parts, by exciting actions favourable to the increase of power.

The utility of friction in the treatment of disease is not a modern discovery ; for, ever since the days of Hippocrates, it has been a practice more or less generally adopted, to relieve parts in a state of debility by thus me-

chanically assisting the too languid circulation of the fluids. The moderns would, indeed, appear to have unaccountably neglected this important remedy; and the great advantages which have been derived from its employment, in the practice of Mr. Grosvenor of Oxford, as well as in my own practice, leave no doubt in my mind, that it would afford a most important means of cure in a vast number of diseases. The history of this very remedy would, in fact, add another example to those already detailed, of the vicissitudes which our most important therapeutic agents undergo from the caprice of fashion. To some the practice of Mr. Grosvenor may appear to possess the merit of originality; but let such refer to our neglected classics, and it will be found that it only affords a striking example in proof of the adage, that "there is nothing new under the sun;" that the existing practices of the human race are only revivals of ancient customs.

The following quotation from Celsus is introduced, because it not only proves the truth of the foregoing assertions, but because it contains in a few words, and these the words of Hippocrates, almost all that is known on the subject, even at the present day.

"Oportet autem neque recentiores viros in iis fraudare, quæ vel reppererunt, vel recte secuti sunt; et tamen ea, quæ apud antiquiores aliquos posita sunt, auctoribus suis reddere. Neque dubitari potest, quin latius, quidem, et dilucidius, ubi et quomodo frictione utendum esset, Asclepiades præceperit; nihil tamen repperit, quod non a vetustissimo auctore Hippocrate paucis verbis comprehensum sit: qui dixit, frictione, si vehemens sit, durari corpus; si lenis, molliri; si multa, minui; si modica, impleri. Sequitur ergo, ut tum utendum sit, cum aut adstringendum corpus sit, quod hebes est; aut molliendum, quod

induruit ; aut digerendum in eo, quod copia nocet ; aut alendum id, quod tenue et infirmum est.”*

Nor is this art one easily acquired by nurses of ordinary intelligence. If at any time I have occasion to increase the number of those rubbers, whom I keep in constant employment, I find that with all the attention I can give to directions, my wishes are never carried into execution with accuracy. In fact, although it is a very mechanical process, it requires months of practice to render a person perfect in the art of employing it.

I am convinced that the principal cause of the neglect of friction among the moderns arises from the difficulty of obtaining persons properly experienced in the art. The imperfect manner in which the operation is commonly performed struck me forcibly some years ago, when on a visit at Oxford, during the life of Mr. Grosvenor, I had an opportunity of observing the adroitness with which his rubbers used friction, and the steadiness with which they continued it for hours without any interruption. It was this visit which induced me to educate some poor persons in the art, and to keep them in my constant employment as rubbers. And here I would beg leave to observe, that it is really much to be desired that the profession would give encouragement to the general establishment of nurse-tenders, who would devote their attention to acquiring a proper knowledge of the art of friction ; and its extensive utility in many obstinate diseases, would soon render it a most popular remedy.

The bare hand, or the hand covered with a woollen glove is the best instrument for friction. A small quantity of hair powder, or fine flour, should be interposed, between the skin of the patient and the hand of the rub-

* CELSUS, loc. cit. Lib. II. sec. xiv. p. 76.

ber, to prevent any chafing. Very great advantage will be obtained by causing a gentle stream of vapour to play upon the part while friction is applied. We have a very convenient instrument for this purpose at the Skin Infirmary. In the want of this, we may make a substitute of a common tea-kettle, by attaching to its pipe a flexible tube, made by coiling wire into the form of a suspender spring, and covering this with close canvass, the inner surface of this having been previously soaped.

The various mechanical operations, which have been denominated massing, shampooing, thumbing, kneading, &c. &c. may be included under the head of percussion; for each and all of them essentially consist in the application of a circumscribed, momentary, or transient pressure, frequently repeated; and they all produce their beneficial effects, by compressing the vessels in such a manner as to increase the rapidity of their circulation. They may, however, as I have said above, act also by a stimulating agency.

Although these practices are here in almost total disuse, there are none more generally employed in other countries. Nor are there any from which more remarkable effects have been obtained, both in preserving health and in removing disease. In Finland, Russia, Turkey, Egypt, India, China, and in the South Sea Islands, the practice is universal; but the manner in which it is employed is very different in these different countries. In some, a process of flagellation is used: the instrument employed being a small bundle of minute twigs, rendered soft by immersion in hot water, or by exposure to vapour or steam. Galen speaks in the highest commendation of this practice; and we are informed by Suetonius, that by it, Antonius Musa, physician to Augustus, cured that Emperor of a sciatica, which had resisted all other

means. Pouteau recommended, that percussion should be applied by allowing a stream of minute pebbles or coarse sand, previously made hot, to fall from a height on the part affected; and Dr. Gower, of the Middlesex Hospital of London, has recommended for the same purpose an instrument of the form of a hammer: the striking end of which is made of cork. He has denominated this instrument a pulsator.

The hand is, however, the best and most commonly employed means for performing these various processes. It may be used in different ways. As by gently pressing or kneading with the thumbs, or with the ends of the fingers, or with the closed hand, or by causing the hand or points of the fingers to be propelled with an impulse upon the part, or lastly, by grasping alternately, with either hand, the limb affected—one hand being placed at either side, in such a way, that they may meet and surround the limb. But, whatever may be the way in which the operation is performed, it should be conjoined, whenever there is the means, with the exposure of the patient, during the process, to the influence of heated air or vapour. This is my uniform practice at the Skin Institution, and the highly beneficial results fully justify the encomiums which different authors have lavished on this remedy.

If practice be necessary to enable an attendant to perform friction with art, it is still more necessary in shampooing. But the nurse-tender, who has been instructed and who has acquired a knowledge of friction, soon becomes an expert shampooer. Indeed, shampooing and friction may and should, almost always be combined. The following is the manner in which these processes are performed in conjunction at the Skin Institution.

The patient, previously undressed, enters the shampooing apartment, already heated to the temperature of about 110 F°. He then reposes on a cane sofa, and a small quantity of aqueous vapour impregnated by passing through some aromatic or odoriferous herbs is allowed to enter the apartment. This vapour gradually diffuses itself and distributes a delightful fragrance. The patient remains in this situation until the surface of the body becomes gently moist. The shampooer now enters, and first submits the entire body of the patient to that degree of friction which may be necessary to disengage all branny or furfuraceous deposit from the surface of the skin. The process of shampooing is then commenced, and the shampooer, by gently grasping, pressing, and kneading, with the fingers, thumb, or entire hand, variously modified and employed from the extreme parts to the trunk in the line of direction of absorption and venous circulation, continues the process for a longer or shorter time, according to the nature of the disease and the feelings of the patient; the percussion being occasionally interrupted for the purpose of extending, in a gentle manner, such parts as are in a state of rigidity. The whole process is then terminated by gently cleansing and drying the entire surface with a soft towel. The patient then withdraws into an adjoining apartment, the temperature of which is not inferior, when he enters it, to that of the shampooing room; but after he has reclined for some time on a bed or sofa, or after he has got himself dressed, the heat of this second room is gradually lowered to that of the external

* For a description of the SHAMPOOING APARTMENTS at the DUBLIN SKIN INFIRMARY, see my ACCOUNT of the APPARATUS, which has been constructed at this INSTITUTION for the TREATMENT of RHEUMATIC and CUTANEOUS DISEASES; illustrated by many plates—in 4to.

atmosphere by a particular contrivance; but, in so slow a manner, that no vicissitude whatever is experienced by the feelings of the patient.

The beneficial consequences, which always result from the process of shampooing, when properly employed, and in appropriate cases, are most striking. I have often known patients sink into a slumber and enjoy several hours of delightful tranquillity after the operation, who had scarcely slept for weeks before; and I have known patients, who were scarcely able to move a limb on entering the apartment, and who were consequently carried into it, able to walk out erect and with steadiness. In short, I have, on many occasions, seen almost realized the picture drawn by the popular author of the "Letters on Egypt." "Perfectly massed," says he, "and as it were regenerated, you experience an universal comfort. The blood circulates with freedom, and you feel as if disengaged from an enormous weight, together with a suppleness and lightness to which you have hitherto been a stranger. A lively sentiment of existence diffuses itself to the very extremity of the body, while consciousness is lost in the most delicious sensations; and the soul, sympathizing with delight, enjoys the most agreeable reflections. If life be nothing but the succession of our ideas, the rapidity with which they then recur, the vigour with which the mind runs over their extended chain, would induce a belief, that, in the two hours of that delicious calm that succeeds the operation, one has lived a number of years."

Again, on the other hand, I have found a single operation produce feverish symptoms, and a restless night, when employed by patients contrary to my wishes, and because they had observed others, whose cases appeared to resemble theirs, obtain from it the greatest advantage. The principles, which have been laid down in the pre-

ceding pages, fully explain these opposite results. In fact, if those remedies which are calculated to excite tone be employed in the state of increased action, they will uniformly increase the disease and aggravate every symptom; while the same cases will be benefited by opposite measures. Again, if those remedies which are suited to diminish action be persisted in beyond a proper time, they will render the diseases for which they are administered much more malignant in their nature, and more difficult of cure. To use the words of Mr. John Bell, on an analogous occasion, "That disease, which, with but a little indulgence, a very little encouragement of fomentations, poultices, bleeding, and low diet, would end in white swelling of the knee, may be stopped even by so simple a matter as a well-rolled bandage."*

Having now investigated the principles which should regulate us in the treatment of the diseases that form the subject of these pages, it might be useful to consider the means which should be employed to prevent their return, when they have been once removed. This is a subject upon which patients frequently form very erroneous judgments, and are often most unreasonable in their expectations. They appear, in general, to suppose that the cure of a disease had not been effected, if that disease, or rather the same form of disease, should, by any circumstance, recur at any future period. But such patients should consider, that, although some diseases have the power of rendering the system insensible to those causes by which they have been in the first instance produced, the reverse is the case in respect to the greater number of maladies to which we are subject; and the pre-existence of a disease is, frequently, so far from becoming a cause of

* Principles of Surgery, Vol. I. p. 127.

protection, that it is found to constitute a source of disposition to future attacks, when the causes of the disease are again applied. It is the province of the Physician or Surgeon to remove disease, but it is the business of the patient so to conduct his mode of life as to prevent, as far as possible, the application of those causes, which may tend to re-excite it.

A full consideration of the various attentions, which are required for the prevention of disease, would occupy more space than could be possibly devoted to it in this publication. Nor is this necessary, for the reader may easily collect, from the exposition of principles which has been made in the preceding pages, all that I can say for the regulation of his conduct in this respect. In fact, our endeavours must all tend to the great object of preserving and improving the tone of the system, or of the parts more particularly diseased. But this improvement of tone will not be produced, as is too generally supposed, by that full living from which it is vulgarly thought, that all health and strength necessarily spring. The ingesta must be ever regulated by the wants of the system, and these will be always proportioned to the muscular exertion of the individual, and to the activity of the various excretions. The quantity and quality of food suited to each individual, must be always adjusted by the wants of his own system, and not according to what agrees or disagrees with another. He must also have a rule of conduct, peculiar to himself, for the regulation of his bodily and mental exertion; both of which should be exactly proportioned to his powers, and such as to give full exercise without fatigue. The final object of all our functions is to bestow on us the faculty of performing those corporeal and mental efforts which characterize our species; and there is here, as on all other occasions, such a

connexion between the means and the ends, that the exertions of the one afford the most certain mode of exciting the required state of the other. These exertions, to use the language of Mr. Hunter, may be said to afford a stimulus of necessity. If due attention be paid to the various practices which these principles inculcate, there will be little use for the employment of any other measures, unless we except such as are necessary to protect the system from the influence of those physical agents, the removal of which is not within our controul: such are the vicissitudes of the atmosphere; and in no other diseases is the powerful influence of these vicissitudes more distinctly observable, than in those of which I am treating. In fact, patients who are subject to these diseases ascertain, by the state of their feelings, all the changes of the atmosphere, with as much accuracy, as those physical instruments which are constructed for this express purpose.

There can scarcely exist a doubt that atmospherical vicissitudes act on more of our organs than on the skin; but their influence on this organ is of the most importance to us, as it is probably the skin which feels this influence with greatest force, and as it is the organ which we can protect from that influence with the greatest facility.—The importance of a healthy state of the skin has not been sufficiently insisted on. And we are the more surprised at this, as physiologists are well aware of the very important function which it performs, as an organ of excretion. The most superficial practitioner does not neglect either the urinary discharge, or the discharge from the bowels; but the excretions from the skin should equally obtain his attention. Of this we shall feel convinced, if we reflect, that it is the duty of this organ to discharge, at the lowest calculation, by *insensible perspi-*

ration, not less than thirty ounces of excrementitious matter in the course of twenty-four hours. An assertion which could scarcely be accredited, if its truth had not been ascertained by numerous experimental inquiries, which leave not the smallest shadow of doubt upon the subject. It is well known that the Italian Physician Sanctorius led the way in this field of inquiry, to which he devoted the greater part of his life; and it is also known that his experiments have been followed up by Dodart, Keil, Rye, Gorter, Linings, Robinson, Home, Stark, Abernethy, Hales, Haller, and Lavoisier and Seguin. The general principles which regulated the experimental investigations of these inquirers, upon this subject, were much alike. They all proceeded upon the plan of Sanctorius, of weighing the body, adding the aliment received, deducting the discharges, and placing the loss which it had sustained to the account of the cutaneous transpiration; but it was only the latter of these authors who accurately distinguished the loss from the lungs from that by the skin.

Were I to enter on a full investigation of the various considerations connected with this important function, a large volume would not contain the valuable facts which should be brought forward; and feeling the importance of the subject with all its force, it is one upon which I dare not enter at present. I shall, therefore, conclude by simply observing, that I know of no means so highly calculated to preserve the cutaneous organ in full vigour, and consequently to protect the system from those diseases which result from its derangement, equal to the constant and daily ablution of the entire surface, by means of either a shower-bath or sponging—and, in either case, the water should be used of the temperature of about 65 F°. Whether it be the bath or sponging that be chosen, the gen-

eral surface should be afterwards well rubbed with a coarse towel. If sponging be preferred, vinegar will often, particularly in weakly subjects, answer our purpose better than water.

In the management of chronic disease, it is often extremely difficult to obtain sufficient perseverance on the part of our patients to do justice to our plan of treatment ; and when, by whatever system we have adopted, the disease has been much alleviated, we can seldom succeed in securing a continuance of proper attention, until the morbid action has been completely subdued. We are, therefore, called on to inform such patients that, in proportion as the disease has been long in existence, in the same proportion, *ceteris paribus*, must its removal be tedious ; and if they have not sufficient steadiness to persevere in that system, which is necessary for their own welfare, when they are honestly put in possession of their case, whatever may occur, they alone will be accountable for the results, and our professional character can never suffer.

SECTION VI.

CASES OF PAINFUL, PARALYTIC AND SPASMODIC DISEASES OF THE NERVES AND MUSCLES, TO ILLUSTRATE THE UTILITY OF MOXA.

“The main business of Natural Philosophy is to argue from *Phænomena*, without feigning hypotheses.”

NEWTON.

THE diseases, of which the following cases afford examples, are all essentially characterized by lesion of the functions of motion and sensation. The nerves and muscles are the organs by which these functions are performed; and as the connexion which exists between these organs is so intimate, that even in the present advanced state of physiology, we are not always able to allot to each its respective share of influence in the performance of certain functions,—it follows that these diseases may be considered as forming a natural group.

We need not wonder that the public should confound under the same name, many very dissimilar painful affections, when it is recollected, that until about the middle of the seventeenth century, when the work of Ballonius de *Rheumatismo et Pleuritide dorsali* was published, gout and rheumatism were not distinguished from each

other in nosological writings ; and that it is only within the last few years that a class of affections, seated in the nerves, and possessed of very peculiar characters, have been distinguished from rheumatism. For this improvement in nosology we are indebted to Chaussier, one of the Professors of the School of Medicine of Paris, who has given to this class of affections the very appropriate name of neuralgia—*νευραλγια*, from *νεῦρον*, nerve, and *αλγος*, pain.

The pain which attends on this disease, is often intolerable. It frequently darts with the rapidity of lightning along the trunk and branches of the affected nerve : language is sometimes unable to express the dreadful anguish which it excites. Were it continued it could not be borne. The mere exhaustion which it inevitably induces would soon extinguish every vital action, and thereby plunge into the abyss of oblivion the bodily consciousness of the sufferer, who would then freely, indeed, resign an existence of torture for the soothing tranquillity of death. Fortunately, it is intermittent ; and as all our sensations are relative, the heavenly quiet which succeeds the storm, is almost sufficient to recompense the sufferer. Thus, we may say in the language of Dr. Paley, “ Pain itself is not without its *alleviation*. It has the power of shedding a satisfaction over intervals of ease, which few enjoyments exceed.” But, although existence may be prolonged by the relief which such intervals of ease afford, the frequent returns of pain gradually undermine and exhaust the powers of the system, and soon convert its victim, however robust and athletic, into a deformed shadow.

The intermissions of pain are frequently attended by peculiar sensations in the course of the affected nerves. There is sometimes a feeling of heat, sometimes of cold.

At times, there will be a painful feeling of numbness, or a sensation of pricking, or as if cold water were running in the course of the limb; and the muscles, which are supplied by the affected nerves, are, at intervals, thrown into a state of cramp and spasm, which often produces great distress.

The recurrence of the paroxysm of pain will frequently observe regular periods; and when this is the case, the evening or the night generally the time chosen for its attack. But, on other occasions, there is no regularity observed, and the sufferer cannot promise to himself the slightest security at any fixed time during the whole diurnal revolution. Perhaps he becomes a prey to his direful enemy when he feels himself in greatest security, and at a moment which he has vainly allotted to some anxious or pleasurable avocation.

I have said that the pain generally darts from the trunk to the branches of the nerve affected; but, on some occasions, it will follow a reverse direction, and extend from the extreme ramifications to the trunk. At other times, it will start up in some portion of the course of the nerve, and, limiting itself to one spot, will not extend in either direction. In the interval of the pain there is neither redness, heat, swelling, nor tension of the affected parts; and although the paroxysm will frequently arise without any warning, it is often preceded by a turgescence of the vascular system of the seat of disease, with general fulness and increase of heat, and great sensibility to the slightest pressure in the course of the nerve. These symptoms gradually increase until the decline of the paroxysm, when they not unfrequently terminate in an increased discharge from some of the neighbouring exhalants. Thus, a paroxysm of pain in the supra-orbital nerve is frequently followed by a flow of tears, and a

similar state of the superior or inferior maxillary nerve is succeeded by a discharge from the nose or mouth. Are not such phenomena strongly corroborative of the vascular origin of these diseases ?

It is probable that there are no nerves in the body, which may not be affected by neuralgia ; but it certainly attacks those of the face and inferior extremities more frequently than those of any other part. The exposure of the former to atmospheric vicissitudes, and the depending situation of the latter, afford satisfactory explanation of the cause of this preference, and an additional proof of the vascular origin of neuralgia ; for, it is evident, that both of the foregoing predisposing causes must act by influencing the circulation. It is the opinion of several of the Continental writers that many thoracic and abdominal affections, such as angina, cardialgia, gastrodynia, nervous asthma, &c. &c. are owing to a similar disease of the pulmonic and cardiac plexus of nerves.—However this may be, the following species of neuralgia have been correctly ascertained, and frequently witnessed by me :—

1st. Frontal neuralgia : pain commencing in the eyebrow, and from this extending to the forehead, the eyelid, the internal angle of the eye, and sometimes to the entire side of the face.

2d. Infraorbital neuralgia : pain commencing under the eye, and from this extending to the cheek, to the upper lip, the side of the nose, and to the inferior eyelid.

3d. Maxillary neuralgia : pain commencing at the mental hole, and from this extending to the chin, to the lips, to the temple, to the teeth, and to the tongue : the pain sometimes commences in the teeth, and from this extends to the other parts of the face.

4th. Cervical neuralgia : pain in the neck, extending to the sterno-cleido-mastoid muscle, to the back and inside of the ear, and to the back of the head, to the gums, and to the tongue ; producing in the last-mentioned organ a sensation as if it were scalded.

5th. Intercostal neuralgia : pain commencing in the back, and extending, in the direction of the intercostal nerves, round the side, to the front of the chest.

6th. Thoracic neuralgia : pain commencing in some part of the breast, and from thence extending in a radiating manner along the ribs, and down the inside of the arm ; following the course of the thoracic nerves, and the cutaneous nerve of Wrisberg.

7th. Abdominal neuralgia : pain in the loins, and from this part extending round the side of the abdomen to the linea alba ; and sometimes commencing in the side of the belly, and from this extending towards the loins.

8th. Ilio-scrotal neuralgia : pain, which commencing in the loins and following the course of the spermatic cord, extends to the scrotum and testicle, causing a retraction of this organ.

9th. Femoral neuralgia or sciatica, (the sciatic gout of some authors, and the *ischias nervosa postica* of Cotunni) : pain commencing in the hip, and sometimes in the loins, and from thence often extending to the groin and scrotum, to the posterior surface of the thigh, and to the outer surface of the leg, the ankle, and the upper part of the foot, and toes ; frequently attended by numbness of the foot.

10th. Crural neuralgia, (*ischias nervosa antica* of Cotunni) : pain which, commencing in the groin, extends along the front of the thigh, the inner side of the leg, to the internal ankle, and upper part of the foot.

11th. Plantar neuralgia : pain which extends from the

heel, along the sole of the foot, in the direction of the plantar nerves.

12th. Anterior tibial neuralgia : pain commencing below the patella or joint of the knee, and from this extending to the upper part of the foot.

13th. Cubito-digital, or ulnar neuralgia : pain sometimes commencing in the neck, and from this extending along the inside of the arm ; but more frequently beginning at the elbow, and following the direction of the ulnar nerve, it extends along the inside of the fore arm, to the same side and back of the hand ; and in general terminates in numbness of the little and ring fingers.

14th. Neuralgia of the external musculo—cutaneous nerve : pain commencing in the side of the neck, or at the inferior angle of the scapula ; and, from this, extending along the outer part of the arm and fore-arm to the index and middle fingers, where it ends by causing numbness.

14th. Anomalous neuralgia, which is the name given by Chaussier to a variety of nervous pains, which start in different parts of the trunk and limbs.

I have never seen a well marked case of neuralgia of the fascial nerve, and I have some doubts of the correctness of those cases which have been recorded as such. Opportunities seldom occur of examining the state of the nerves affected by neuralgia. But the observations which have been made on this subject will go to prove, (one or two excepted,) that these complaints are always connected with structural derangement. Cotunni observed, in sciatica, inflammation of the envelope and of the substance of the nerve, infiltration of its tissue, and disorganization of the nervous pulp. Siebold, in a case of inter-costal neuralgia, found the nerve red and emaciated. Civillo, in a similar instance, found the nerve thickened and hardened. Bichat, in a

case of sciatica, observed a varicose dilatation of the veins. Van-de-keer witnessed a remarkable vascular injection of the neurileme or covering of the nerve, and the medullary matter, of a grey colour. Martinet found the nerve red, the neurileme injected, and infiltrated with a limpid, purulent, or bloody serosity; and an enlargement of the proper texture of the nerves, which was sometimes hardened and sometimes softened. Yet, we are informed by Desault and Rousset, that they have not been able to detect any alteration of structure in some cases, which have occurred to them. But, as I have already shewn, this negative evidence can have no weight, as long as our means of detecting morbid structure are so imperfect. As far as my own observations go, they fully support the opinion, that the structure of the nerves is, in such cases, more or less altered, although the nature of this alteration is subject to considerable variety. I have found their vessels uniformly enlarged, their texture sometimes hardened and sometimes softened—and their size occasionally diminished, but more frequently enlarged.

Thus it appears, that the class of diseases denominated neuralgia, are peculiarly suited, by all their characters, to that system of treatment, which has been considered in the preceding pages; and, although the object of this publication requires, that the cases which I shall now bring forward be selected with the view of illustrating the influence of Moxa in their treatment, the reader will not suppose, after what has been said, that this remedy is either necessary in every case, or that those cases, in which it must be employed, should not receive the benefit of other means of cure at the same time.

CASE I.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.

July 14, 1826.

Marianne Clinch, from 29, Great Britain-street, aged 42, of a tall figure, pale complexion, the mother of twelve children,

Complains of violent pain in the right side of the loins, extending into the corresponding hip, along the back of the thigh, and outside of the leg to the same angle. The pain frequently seizes her in some one of the parts mentioned, without commencing in the loins. When in bed, she is unable to lie on the affected parts, or permit the most trifling pressure on them. The skin also is so sore to the touch, that she cannot bear to have it handled. Heat affords some relief to the pain, and she is, therefore, careful to have the limb rolled at all times in flannel. Damp weather produces an increase of her distress. When she walks she is very lame; the spine is concave on the affected side, the opposite shoulder elevated, and the diseased hip projects in an unnatural degree:

Emaciation, cough, night-sweats, menstruation very scanty and irregular, during the last nine months. Pulse small, frequent and feeble.

Has had the painful affection, more or less, for six years; but, during the entire of the last year, it has become almost intolerable. Has left no means of cure within her reach untried; and never obtained from any thing which she has used more than very temporary relief.

Discharged cured of all pain on the 25th of August: her pulmonic disease appeared also to have got a check. Four applications of the Moxa had been made, viz.: one

below the ankle on the 25th of July, one to the posterior and outer part of the leg on the 29th;—one behind the right trochanter on the third of August, and one to the posterior surface of the thigh on the 16th. She used no other remedies from the application of the first Moxa to her discharge. From the 17th of July to the 25th, she was under the influence of the extract of aconite, which she took to the extent of six grains three times a-day, but without the slightest relief. The general debility of her system prevented me using any evacuants either topical or general, as a preparation for the Moxa; which, from the painful state of the parts upon pressure, I would under other circumstances have been induced to do.

CASE II.

Charitable Infirmary, Jervis-street,
August 16, 1826.

Patrick Lamb, aged 42, from St. Doulough, a labourer, in the employment of Mr. Rutherfoord of Rutland-square,

Complains of acute pain in the inferior angle of the right scapula, shooting from that point, along the latissimus dorsi, to the middle of the posterior edge of the deltoid, and thence along the posterior and external part of the arm and fore-arm to the wrist, where it terminates by numbness and coldness of sensation in the posterior surface of the index and middle fingers. He also complains of stiffness and pain in the right side of his neck, along the edge of the trapezoid muscle. Whenever he allows the limb to hang, the pain becomes excruciating in the

line of direction above described ; and when he attempts to place it in a sling, a feeling of numbness is excited through the whole limb, which is quite intolerable : he is therefore obliged to keep his arm elevated and supported by resting the palm of his hand on the top of his head. He is unable to lie on the affected arm at night.

These complaints have been produced by a fall on the shoulder, some weeks ago. He has used leeches, blisters, liniments, pumping, and friction, without relief.

Discharged cured on the 11th of September. The Moxa was applied nine times in the line of direction of the pain. The first was placed at the inferior angle of the scapula, and the last on the back of the wrist. The dates of their application were the 16th, 17th, 19th, 21st, 26th, and 30th of August, and on the 4th, 7th, and 8th of September. No other means whatever were used, except the acupuncture needles, which were twice introduced ; viz. on the 24th and 28th of August.

When he was discharged, none of the eschars had separated ; nor was there the most trifling inflammation in the skin surrounding any one of them. He remains well ; all the eschars have separated in scales, and the ulcers are healed.—October 10.

CASE III.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 18, 1826.

Margaret Savage, aged 40, a widow, residing No. 7, Temple-court, Temple-street, in the habit of earning her livelihood by supplying newspapers to the inhabitants of Mountjoy-square, and the adjoining streets,

Has been subject for several years to an asthmatic cough, which was always particularly severe during the winter. It ceased entirely last spring; but was succeeded by pain in the right knee, shooting violently down the front of the leg, to the upper part of the foot and ends of the toes. This pain is most severe at night. The entire limb is weak and tremulous. The veins become turgid, and the leg swells, and grows extremely stiff and hot, about four o'clock daily. She is rendered unable to earn her livelihood; has not been out of her bed for several weeks, except for the purpose of applying at hospitals and dispensaries for assistance. Has obtained no relief whatever, from a great variety of remedies which have been used by her.

She was discharged cured on the 27th of September—no means having been employed, except two Moxas; one of which was placed immediately over the patella, and the other on the front of the middle of the leg. She was free from pain long before her discharge; but the ulcers produced by the Moxa were very tedious in healing, and very irritable for an unusually long time.

CASE IV.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 22, 1826.

Thomas Darcy, aged 60, residing in a cellar in Strand-street, a labourer in the employment of Mr. W. Dobbin, builder,

Complains of pain, extremely severe, in the region of the right trochanter; shooting, on one hand, into the lower part of the abdomen, a little way above the middle of the left groin, and, on the other hand, down the thigh to the middle of the leg; numbness of the thigh and leg.

The pain is not constant; yet there is not any fixed period at which it is more or less painful: it is, in general, as severe during the day as during the night. If he be at work when seized by it, he becomes extremely lame, is obliged to sit down, and a cold moisture quickly covers his skin. When he rests after work, his limb is most painfully stiff.

He dates the origin of these complaints six years back: they have, however, latterly become more severe. To use his own language, he has tried "every cure that ever was heard of."

Discharged cured on the 20th September. The Moxa was applied in this case three times; viz. on the 23d and 30th of August, to the back of the thigh, and behind the trochanter; and on the 10th of September to the outer part of his leg.

CASE V.

Merchant's Quay, August 23, 1826.

Mr. A. G——, aged 30—Complains of violent pain in the region of the right trochanter, in the same groin, and in the outer portion of the thigh. From these situations it extends downwards to the outer and middle portion of the leg; or, from his description, it commences in his leg, and extends upwards. He is very lame, and the spine inclined off the affected side, with an elevation of the shoulder of that side. The pain is constant, and extremely severe at night, rendering him almost unable to turn in his bed. It is increased by exercise. Had numbness in his foot, when first attacked by the complaint, but has none now. Has a pallid, sickly, countenance; yet, he says, his general health is extremely good.

Has laboured under these complaints for eight months.

Has tried a great many remedies, and in vain. Had a fever some weeks ago, when the pain left him; and upon his recovery from the fever, he congratulated himself that his pains had been removed; but, as soon as he went about his business, they returned with increased violence.

This gentleman was cured by the application of two Moxas—one to the hip, and one to the groin. He was under my care six weeks. The first fortnight was employed in reducing a degree of increased action, which appeared to exist. For this purpose rest, cupping, and the tepid bath, were used. When the first Moxa was applied, the pain was extremely severe, but intermittent; seldom attacking him, except at night.

CASE VI.

Charitable Infirmary, Jervis-street.
August 28, 1826.

Martin Byrne, aged 26, residing at No. 7, Off-lane, a labourer in the employment of Mr. Taffe, of the Pipe Water Establishment,

Complains of severe pain in the left hip, behind the great trochanter, extending upwards to the sacro-iliac symphysis and loins, and downwards, along the back of the thigh and outside of the leg, to the ancle and external part of the dorsum of the foot. There is frequently a distressing and creeping sensation of numbness in the entire limb; and sometimes a sensation as if cold water was running in the line of direction, in which the pain occurs. There are violent cramps, occasionally, in the calves of his legs at night; weakness of his loins, with a sense of stiffness and confinement in his hips and lower part of his back. If he attempts to extend the limb fully, while he is in the recumbent posture, an acute pain

seizes his hip, and the outer part of his leg; and the same pain is produced by the act of standing. The pains are extremely severe on the nights of those days on which he has exercised.

His figure is very much deformed. During progression, he throws the weight of the body off the affected limb on the opposite thigh; yet, owing to a second lateral curvature in the spine, the right shoulder is much higher than the left; there is a hollow on the left side of the trunk between the ribs and pelvis; the abdomen projects to the front and right side, and there is a remarkable fulness in the superior and posterior part of the left hip. When placed on his back, there does not appear to be any difference in the length of the two limbs; and he lies in such a way as to throw one shoulder more forward than the other.

Has been labouring under this painful affection for some months; was not deformed prior to the occurrence of the pain; attributes his complaint to exposure to cold last winter; has been at several hospitals, and has used blisters, liniments, and a variety of other remedies without relief.

On the 28th of August, a Moxa was applied behind the left trochanter; and on the 30th, a second to the sacro-iliac symphysis of the same side; on the 2d of September, a third was applied on the loins; a fourth on the day after to the outer part of the leg, and on the 7th, a fifth was placed on the front of the ancle. On the 11th of September, he was free from all pain; but on account of the weakness of his loins, and my wish to ascertain how far his figure would be recovered after the removal of the pain, he was allowed to remain in hospital until the 26th of October, when he was discharged free from all complaint, and vastly improved in his figure

and mode of walking. From the date of his admission to the application of the last Moxa, no other remedies whatever were used. Between the employment of the last Moxa and the date of his discharge, he got two sulphur fumigations, which afforded much relief to the weakened and confined feelings in his loins and hips. During the progress of the separation of the eschars, a painful swelling of the glands of the left groin took place, which lasted for several days, but they did not suppurate.

CASE VII.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-street.

August 31, 1826.

John Nowlan, aged 45, a watchman—complains of extremely severe pain in the right hip, extending in the course of the sciatic nerve down the thigh to the outside of the middle of the leg, in which situation it is, sometimes, most distressing; great weakness in the loins, referred to the level of the superior edge of the crest of the ilium; painful numbness in the limb, if exposed to any cold wind. These pains are most severe when he sits or lies, which obliges him to spend his time, as much as possible, limping about. When in bed he cannot lie on the affected side.

He is very lame; his figure much distorted; the left shoulder raised, the right depressed, the spine concave on the right side, and the corresponding hip unnaturally prominent.

Has been subject for several years to pain and weakness of his loins, particularly on exposure to cold. Within the last four months this pain and weakness has become almost constant, more severe, and conjoined with the painful affection of the hip and leg. This increase of his complaint he attributes to his having

been for some time without a watch-box, which obliged him to rest during the night, by sitting on damp and cold steps at doors, which he says "caused the pain to pass down from his loins to his hip, and from that to his leg." His general health is good, although he looks pale and languid.

Discharged cured on the 25th of October. This case was very obstinate, which is explained by the consideration, that, during treatment, he continued to perform the duty of a watchman, by which he was necessarily exposed to the night air. The Moxa was applied nine times; viz. twice to the loins, twice to the hip, three times to the thigh, and twice to the leg. Its action was assisted by sulphur fumigation, during the latter part of the treatment.

CASE VIII.

Sackville-street, August 3, 1826.

Mrs. C——, aged 30, mother of several children—Complains of acute pain shooting in all directions through the right side of her face and head. The pain darts with great violence and rapidity. It comes on at intervals; is in general most severe at night; appears sometimes to begin in her teeth—none of which are, however, diseased on the affected side. Each paroxysm subsides with a copious discharge of a watery fluid from her nose. The hearing of both ears is greatly diminished, and she is distressed by a constant noise in them. She has had the painful affection of the side of her face for several months, and the deafness for a number of years. She attributes the loss of hearing partly to her having bathed when warm, and partly to cold caught after parturition. Has, frequently, flushings of her face, with head-ache; is regular in her menstrual discharge; her stomach dyspeptic, with occasional colic.

She has used a variety of remedies for the painful affection of the face—never received any benefit from any of the means used, except from leeches, which she was herself induced to apply, from having obtained great ease on the occasion of a spontaneous discharge of blood, which came from her nose.

I applied a very minute moxa, twice a week, in the course of the branches of the superior and inferior maxillary nerves; and in the interval I took away some blood by leeches, and employed daily the hot bath with the application of cold water to the head. This treatment, assisted by a few simple remedies for the relief of her stomach and the regulation of her bowels, succeeded, in the course of six weeks, in removing all symptoms of pain, and greatly diminished the noise in her ears. She continues quite well in all respects, her hearing excepted.

CASE IX.

Charitable Infirmary, Jervis-street.

August 24, 1826.

The following case of disease of the hip joint, accompanied by most severe pain in the course of the nerves of the thigh and leg, is introduced for the purpose of demonstrating that the neuralgia which attends this affection, is capable of receiving benefit from the Moxa.

William Hollywood, aged 15, from Cloughrim, in the neighbourhood of Swords, son to a carter in the employment of Mrs. Shaw,

Complains of most severe pain in the outside of the right thigh and leg, commencing in the groin and about the trochanter, and extending downwards as far as the outer angle. The pain is almost intolerable at night, uniformly preventing him from obtaining any sleep until morning.

The patients of the ward inform me, that his nights are spent sitting on the edge of the bed, pouring forth frequent screams and lamentations, which he says he is unable to restrain. His thigh and leg are much wasted. He also complains of weakness in the lower part of the dorsal vertebræ, in which situation there is a convexity about three inches in length. There is scarcely any pain upon pressing about the hip joint, or on the convexity in his back. He lies with great difficulty on his back, and can scarcely bring his trunk and lower limbs into a straight extended position. The affected limb is nearly three inches longer than the opposite, with a corresponding inclination of the pelvis. He is unable to walk without crutches, and even with their assistance he cannot allow more than the toes of the right foot to touch the ground. When standing, as erect as possible, his right shoulder is considerably higher than the left, the left side of the trunk concave, and a convexity on the right. The pelvis, at the right side, is not only depressed several inches, but is also thrown forward along with the diseased limb. Has had a pain in his back for twelve months, and the hip has been affected four months. The former he attributes to lifting heavy loads, but cannot assign any cause for the latter. Has had a caustic issue behind the trochanter, and allowed it to heal, because he did not find it followed by any alleviation of the symptoms.

From the date of his admission to the 15th of September, nine Moxas were applied in different situations, according to the seat of pain at the time, viz. : three to the hip, one to the groin, one to the back, two to the outside of the thigh, one to the outside of the knee, and one to the leg. All, except those which were applied to the hip, were allowed to cause only the most superficial eschar. He is now (25th September) free from all pain, rests

extremely well at night, walks much better, more straight, and without crutches. What the final result of this case may be, it is impossible yet to say. It was most remarkable how readily this boy, who is naturally timid, not only submitted with cheerfulness to the frequent employment of the Moxa, but even intreated, from the conviction he had of the great relief which it afforded him, that it should be applied oftener than I thought adviseable. If, at any time during the act of application, he made any complaints, they were immediately stopped upon my threatening to remove the Moxa, or not to apply it again. He often declared that he would rather have the Moxa applied many times, than the caustic once.

I have one observation to make on this case and on the preceding cases of sciatica, in explanation of their symptoms. It is known that disease of the hip, like sciatica, has a remarkable effect on the direction of the spine; but the various changes, which take place in this portion of the skeleton at the different stages of these complaints, have not been sufficiently noticed. The first change, which occurs, is an inclination of the spine to the side opposite the affected limb: there is thus produced an elevation of the shoulder of the morbid side. But, in a short time, the trunk is found to incline, by the formation of a second lateral curve in the opposite direction; and then the shoulder of the affected side becomes depressed. In this state, the figure continues for a long time; but, as the disease advances, and particularly if a young person is the subject of it, a third curve takes place, by which the trunk is again thrown off the diseased member; so that the spine, when viewed laterally, is at last of the form of S: with the shoulder of the affected side elevated. It is not necessary to inform the reader, that these various changes occur in the line of direction of the spine, for the com-

bined purposes of removing the superincumbent weight off the diseased limb, and, at the same time, preserving the equilibrium of the body. The preceding case of Hollywood affords an example of the third degree of this curve; the case of Nowlan of the second degree; and that of Mr. A. G. of the first degree.

The disease, of which the cases that I am now about to lay before the reader afford examples, may be denominated Myalgia, from *μῦν*, muscle, and *αλγος*, pain. These cases are generally classed among rheumatic diseases; but they will be found to differ from rheumatism, as much as those affections, which Professor Chaussier has classed under Neuralgia. One of the most striking characters of rheumatism consists in the disposition which it has to move from one part of the body to another; but, in myalgia, the pain is fixed to one muscle or set of muscles; and, although it may remit, when it recurs, it attacks the same parts. This is also the case in neuralgia; the pain remains confined to the trunk of one nerve, or to its branches, or to those branches which are immediately connected with them. It is highly important to bear these considerations in recollection, for, while few cases of pure rheumatism will receive more than temporary benefit from the Moxa, chronic myalgia will immediately yield to its influence.

There are probably no muscles of the body which may not be attacked by myalgia; but it certainly seizes, in preference, those which are most employed. It hence occurs, very frequently, in the loins, in the extensors of the thigh, in the hip, and in the calf of the leg. The deltoid, and the supinator and pronator muscles of the fore-arm, are those which most frequently suffer, when the disease attacks the superior extremity.

I have had several opportunities of examining, after death, the state of the muscles which had been affected by myalgia ; and I have found great uniformity in their appearances. The firmness of the muscular fibre is always diminished ; it is easily torn ; its color is less deep than that of the other muscles of the body, and there is diffused among its fibres a sero-gelatinous fluid ; while the adipose substance is completely absorbed, and the capillary vessels, which run among the fibres, are varicose. These appearances fully explain the partial paralysis, which is a frequent sequela of long-continued myalgia.

CASE X.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 2, 1826.

James Seagraff, aged 67, Aughrim-street, a labourer.

Complains of violent pain on each side of the knee, shooting upwards along the extensor muscles of the thigh. The pain is more acute at the inner side of the joint, and along the vastus internus, than on the outside of the limb. It is also most severe when he attempts to walk, or make any exertion. He is obliged to keep the limb in a state of constant extension ; and is, consequently, very lame when he attempts to walk.

Has had this affection for two years, and it has latterly become so severe that he has not been able to work.—Blisters and a variety of liniments have been used by him.

One application of the Moxa, on the inferior extremity of each of the vasti muscles, completely removed all pain, and restored the limb, in ten days, to perfect use.

CASE XI.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 12, 1826.

James Carty, aged 32, a sawyer, in the employment of Mr. Fleming, of Cook-street,

Complains of pain, violently acute, in the substance of the calf of the right leg, extending downwards a few inches from the part principally affected; most severe about two o'clock each day, and particularly distressing on those days on which he works. About the middle of the day, the limb swells, becomes hot, its veins grow turgid, and if he has a garter on the leg, he is obliged to remove it; he is very lame; has been labouring under this pain for twelve months; it has become so severe latterly as almost to deprive him of the power of earning his bread; cannot attribute it to any cause; has frequently blistered the part affected, and has used a variety of liniments without relief.

By the application of a single Moxa, applied over the seat of disease, and allowed to burn down, the combustion being aided by the blow-pipe, the pain was immediately removed, and has not returned.

CASE XII.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 30, 1826.

Michael Doyle, aged 50, a labourer in the employment of Mr. Bryan, of Cole's-lane market,

Complains of weakness in the loins, with acute pain on

the outer side of the lumbar mass of muscles. He is unable to stoop: the very attempt produces such acute pain, as to cause a spasmodic interruption to his breathing. The pain is more troublesome by day than by night, but comes on in irregular paroxysms, and is always increased by exercise. He has been labouring under this complaint, more or less, for six years; but, latterly, it has become so severe that he is unable to attend to business. He has used all common remedies. His general health is good.

The application of a single Moxa to the lumbar mass of muscles, and one introduction of a needle, removed all pain, and in one week completely restored the parts affected.

CASE XIII.

Dominick street, September 1, 1826.

Mr. T. C. aged 29—complains of very severe pain in the left hip, extending through the loins to the false ribs of the same side. He is very lame, unable to stoop, or to walk, except at a very slow pace. The pain is more severe during the night than day; at night, his lower limbs are remarkably cold. Has had these complaints for seven months, and has employed a great many remedies.

On the 24th of September, all his pains were removed. Three Moxas having been applied, viz.: one to the side of the false ribs on the 1st of September; one to the hip on the 8th of September; and a third to the same part on the 14th. The needle was introduced once into the hip, between the 2d and 14th of September.

CASE XIV.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
September 4, 1826.

John Dowdal, aged 65, Dorset-street, a baker, in the employment of Mrs. Tipper of King-street,

Complains of weakness and great pain in the lumbar region, preceded by pain in the left sacro-iliac symphysis. Has been labouring under this painful affection for many weeks, and has been able to obtain only temporary relief from blisters, liniments, &c. &c.

A single Moxa, applied to the left side of the spine, removed all his complaints, in the course of ten days.

CASE XV.

Abbey-street, August 18, 1826.

Mr. J——S——, aged 25, complains of acute pain commencing at the head of the vastus externus muscle of the right thigh, and extending from this situation, in the line of direction of the fibres of the muscle, to the front and sides of the knee. The pain is much encreased by exercise, which causes, at the same time, such weakness in the limb that he is unable to raise it, without placing his hand under his leg. A sensation of weakness, and as if cold water was running down the limb, frequently seizes the parts affected. Has most ease when the limb is placed in an extended position. He has laboured under this painful affection for several weeks; and, latterly, he has been rendered unable to attend to business by it. He has used a variety of remedies without relief.

Two applications of the Moxa on the outside of the thigh restored the limb to a healthy state in twenty days.

CASE XVI.

Charitable Infirmary, Jervis-street,
August 24, 1826.

William Flinn, aged 26, from Santry, a labourer in the employment of Mrs. Turbot, and the subject of hip-joint disease in infancy,

Complains of acute pain in the anterior and outer part of the left thigh, commencing about the groin and trochanter, and extending to the knee. It is so intolerably severe at night, that he declares he has not known sleep for several weeks, except during the day; that his nights are spent out of bed, not being able to obtain relief, except by remaining in the cold air, his body bent forward, his hands leaning on the bed, and his leg in state of a forced extension. During the day he is uniformly found with his hands in the act of grasping the thigh below the groin, for the purpose of affording relief.

He was discharged cured on the 20th September, no other remedy having been used except one Moxa, which was applied a little way below the groin, having been preceded by cupping. This remarkable and rapid cure remains permanent.

There are few diseases which exhibit in their origin, symptoms, and immediate causes, greater varieties than paralysis. It may consist in a loss of sensibility of the part affected, while its mobility remains; or the mobility may cease to exist, while the sensibility is unimpaired.

A loss of sensibility is also, sometimes, combined with a state of spasm or convulsion; while a want of the power of motion is frequently united with a state of painful sensibility. The disorganization, from which these different forms of paralysis arise, is seated in either the nervous or muscular tissue, or in both; and while, in some cases, the textures affected are completely changed and disorganized, there is much reason to suppose that, in a vast number of cases, there exists merely an altered state of the circulation of the parts affected. We have abundant proof that a turgid state of the vessels of either muscular or nervous tissue, is quite sufficient to cause a lesion or suspension of the functions of the fibres so oppressed; and that an opposite state, or a deficient supply of blood, will produce the same symptoms, is clearly demonstrated by the phenomena of syncope; and also by the influence which a ligature on the abdominal aorta of a dog, has to cause an immediate paralysis of the hinder limbs of that animal: an experiment made by Haller, and since repeated by Sir A. Cooper, and others. The state of turgescence, or the opposite state, may be the consequence of previous inflammatory disease, or of mechanical injury; or they may be the result of some undefined irritation acting on the part, either directly or indirectly.

It is, probably, only those forms of paralysis, which depend upon the state of circulation of the texture affected, that are susceptible of receiving benefit from the resources of medicine: for, I am much afraid, that when the structure of the nervous or muscular substance is, as it were, torn up, whether by injury or disease, we must leave the reparation to the efforts of nature; and be content with watching her actions, and with protecting them against those causes of disturbances, which might otherwise arise. At the same time, as there are no symptoms, by which we

can, with certainty, distinguish those cases of paralysis, that spring from the latter cause, from those which are owing to the former ; and, as the judicious employment of such measures as are suited to remove that form of paralysis, which depends on vascular derangement, can do no possible harm, whatever may be the state of the texture affected, there is no reason why we should not always have recourse to a trial of such measures, rather than leave the patient to lead his life in helpless misery, without making any attempt for his relief.

There is a particular form of partial paralysis, which attacks children, and which has very frequently occurred to my observation. As I believe it has not been sufficiently attended to, I shall take this opportunity of saying a few words respecting it, before I enter on a detail of the cases, which I have to bring forward, in illustration of the beneficial influence of Moxa in paralytic diseases. I have been frequently consulted by mothers respecting their children, with a request that I would particularly examine the arm or some other limb of the child, because, as they said, the nurse who had the care of the child, had allowed it to fall ; that the limb had been in consequence much hurt ; and that it was not known whether it was broken or not. When we take hold of the limb, on these occasions, for the purpose of examining the little patient, the child shrinks from our touch, the limb often feels hot, and its power of motion is either diminished or entirely lost. There is in fact every reason, from the state of the limb, to form the opinion, on a first view, that some mechanical injury may have been inflicted. But, if we minutely investigate these cases, we shall find, that the reported injury or fall of the child has only been supposed ; and, on many occasions, it will be found that the state of the limb described has been first observed in the

morning, at the time of dressing the child, and that it had been apparently quite well the night before. In short it will, on investigation, appear that the state of the parts affected cannot be attributed to any mechanical injury, and that the disease is a real paralytic affection, not immediately depending on any external cause. Upon close enquiry it will also appear, that the child had been ailing for a number of days; that it had been fretful, sleepy, or heavy; that during its sleep, for some nights, it had started much, and perhaps screamed; and that its appetite and bowels were somewhat out of order.

The seat of the paralysis in these cases, as well as its degree, is subject to much variety: sometimes it attacks an arm, sometimes one or both of the lower limbs, and then it is often mistaken for an injury or disease of the hip or spine. But, whatever may be its seat, when properly understood at first, and promptly treated in a judicious manner, it uniformly yields to medicines directed to improve the state of the digestive organs. But, if the disease be erroneously attributed to an injury, or to disorder of the hip or spine, and its proper source neglected, it becomes riveted in its hold, and extremely difficult to remove. The flesh of the child grows soft—the extremities shrink—and even if their tone be restored, after a steady perseverance for a long time in the use of the measures inculcated by the principles laid down in these pages, they will seldom recover their natural firmness or plumpness, but will almost always remain shrunk and shrivelled, causing more or less permanent deformity during the remainder of life.

CASE XVII.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 3, 1826.

Thomas Long, aged 33, a hackney-coach driver, Dorset-street, has come to the hospital on crutches, without which he is unable to stand,

Complains of loss of power of his lower limbs; their sensibility is not much diminished; the limbs are not wasted, but feel rather full, apparently from adipose deposition; he has frequently retention of urine, and occasional incontinence and ischuria; his stools often escape without his knowledge. There is some pain in his limbs at night, with cramps in the calves of his legs; occasional uneasiness in the loins, but there is no unnatural deviation in the direction of the spine, nor pain on pressure on the spinous processes. He has been paralytic for nine months—blisters, issues, cupping, and a variety of other remedies have been used, from which he obtained some transient relief, but no permanent advantage; he attributes his complaint to exposure to cold, during the end of last winter.

After ten days spent in the improvement of his digestive organs, and in cupping the loins, the use of the Moxa was begun. From the 16th of August to the 28th of October, it was applied thirteen times, at different periods, along the loins and sciatic nerves. He is now, October 30, able to walk without the aid of either crutch or stick; and the only symptom, which he has to preserve his complaints in his recollection, is an incapability of placing his feet on the ground with their natural force and

firmness. The employment of daily friction, and the occasional use of the sulphur fumigation applied from the loins downwards, were conjoined with the use of the Moxa.

CASE XVIII.

Infirmiry for Rheumatic and Cutaneous Diseases, Moore-st.
August 1, 1826.

Thomas Wilson, aged 43, a sailor, formerly belonging to the coal vessel Mary.

He passes his urine slowly and with difficulty, and is frequently unable to retain his stools; he complains of great pain in the lower part of the loins, and in his hamstrings, particularly at night. The natural feeling of his lower limbs is greatly diminished; when in bed, he can draw them up to him, but cannot turn in the bed without great difficulty; and, in attempting to get out of bed, he is obliged to put his hands under the calves of his legs, and thus assist the extensor muscles; he is unable to stand without support. The temperature of his limbs is natural, and his general health is good.

Three months prior to his application at the Infirmary, he had fallen into the hold of a vessel; his feet came first on the ground and then his bottom; he lay in this situation until the following morning, when he was conveyed to an hospital in town. He reports, that a number of leeches were applied to his loins; that they were repeated; that blisters were used; and his urine drawn off daily for upwards of a month. He also says, that he was benefited at first; but that, for the last month, he had made no progress, and that he had left the hospital

because there was not any thing a-doing for him. He admits that he is worse now, than when he left the hospital.

After a fortnight spent in cupping the loins, and the thighs in the course of the sciatic nerves, and in the daily use of the tepid bath, the Moxa was applied by means of the needle on the 15th of August, and repeated twenty-one times, with the interval, in general, of two days between each application.

He was discharged on the 30th of October, in such a state of recovery, that he had perfect command over both urine and fæces, and could walk without the assistance of either stick or crutch. His gait, however, unsteady, his limbs very easily fatigued, and unable to press his feet with force against the ground. On the 4th of November I saw him in the street, I stopped and asked him how he was, when with his hand, he gave himself a slap on the thigh, exclaiming, "he would soon be as stout a man as in all Ireland."

CASE XIX.

Charitable Infirmary, Jervis-street,
July 21, 1826.

Patrick Tute, aged 42, admitted into the hospital on the 21st of July. The day preceding his admission, on coming down a step-ladder, (some of the steps of which were broken) carrying a large sack of corn on his back—conceiving that he was putting his foot on a step, which would support his weight—the step gave way, and his foot went on to the next; and nearly falling, he made a violent effort to recover himself and to preserve his load. This

occurred almost at the bottom of the ladder, and he retained the sack until he got down. On throwing the sack from his back, he found his loins injured, very painful; and a feeling of sickness and weakness came over him, from which he, however, soon recovered.

When admitted, he had not full power over his limbs, he could walk but badly, and complained of much pain in the loins and hips.—Notwithstanding the application of leeches, and other appropriate measures, the want of power in the limbs encreased for several days; ischuria came on, with involuntary discharge of a copious viscid fluid from the urethra.

On the 1st of August, he had considerable debility of the lower limbs—his step remained very unsteady, and he was unable to place his feet with firmness or precision on the ground—the ischuria and involuntary discharge from the urethra continued, with pain in the loins, following the course of the sciatic nerves. Two Moxas were now applied, one to each hip over the affected nerves. These removed his complaints in a few days, and he was discharged cured on the 14th August.

CASE XX.

Infirmery for Rheumatic and Cutaneous Diseases, Moore-st.
August 10, 1826.

William Carson, aged 36, a labourer, in the habit of working in the Potato-market, May-lane.

He is unable to separate his right arm from his side to a greater extent than four inches—can draw it forwards, when he directs it close to his breast, but cannot move it directly forwards: the motion backwards is the most ex-

tensive. He complains of pain in the top of the shoulder, on motion ; and when he attempts to raise the limb, the pain becomes acute, and moves from the top of the shoulder downwards to below the middle of the deltoid.

This affection was produced by a triangle, used for the support of the scales in weighing potatoes, having fallen on the shoulder, about four weeks before his application. He has been frequently blistered, and has used various liniments.

He was discharged cured on the 25th of August ; the Moxa, preceded by cupping, having been applied over the surface of the deltoid five times.

CASE XXI.

Fishamble-street, August 28, 1826.

Mr. J. K——, aged 54—complains of almost total loss of power in the left shoulder and arm, with frequent pain, affecting sometimes the muscles of the scapula, and sometimes those of the arm, and most frequently and most severely the head of the supinator muscles of the forearm. The pain is most troublesome at night. The muscles of the entire limb quiver or tremble exceedingly when he attempts to move it from the side of the trunk, along which it hangs in a powerless state.

This affection of the arm was produced about two months ago by his falling down stairs, when in a state of intoxication—his arm came against the edge of a door, which was open, at the bottom of the stairs, and the limb swelled very greatly after the accident, with great ecchymosis.

He has used leeches, blisters, fomentations, liniments, pumping, without benefit. The operation of cupping having been performed twice, a Moxa was applied to the middle of the outer part of the arm. Immediately after its application, he exclaimed, "that he was ten thousand pounds better—that he was a new man." The Moxa, repeated twice more, restored full power to the limb; and at the end of a month, from the period at which I first saw him, no symptoms whatever existed to recal the former state of the parts to his recollection.

CASE XXII.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-street,
August 30, 1826.

Michael Kelly, aged 50, Thomas's-lane, coachman, formerly in the employment of Mr. Nearney, job-coach proprietor,

Complains of want of power in the left shoulder and arm, with pain, particularly severe at night. The pain is then so troublesome, that he is obliged to keep the limb raised above the level of his head, to afford himself relief. He can make considerable use of the arm, when acting on any object below him, or while his arm is kept with his hand directed towards the ground. When the pain is severe, it is felt in that part of the arm where the upper third joins the two lower thirds: the limb is wasted.

A Moxa, applied at the insertion of the deltoid, immediately removed all pain, and increased the power of motion. A second applied on the 10th of September, pre-

ceded and followed by friction, and the vapour *douche*, restored the limb to health before the month had expired.

CASE XXIII.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.

August 30, 1826.

John Mulherron, aged 47, City-quay, a sawyer, in the employment of Mr. Morton, ship-builder, Ring's-end.

The muscles of his right arm, fore-arm, and hand are much shrunk, particularly those of the fore-arm and hand. The ball of his thumb is perfectly flat, from the shrinking of its muscles ; and there are remarkable hollows in the metacarpal spaces on the back of his hand from the same cause. He is unable to grasp any body with his hand, or to press his fingers with force against one another, and he cannot hold a pen between his finger and thumb or write. He is unable to extend fully his fingers ; and when he attempts to perform any motion, which requires an effort, he experiences pain in all the muscles of the limb. His power is greatest over any object which is under him, and he is therefore able to go on with his trade. The power of the limb is greatly diminished by cold, and the whole limb trembles much.

He says he got a small bayonet wound about twenty years ago in the inferior and front part of the fore-arm ; and he observes that, unless that wound has been the cause of the complaint, he cannot attribute it to any other source : he is evidently much in the habit of using spirituous potations.

Between the date of his admission and the 24th of September, nine Moxas were applied to different parts of the

arm, fore-arm, and hand, accompanied by the occasional employment of the *douche* and friction. At this period he was vastly improved, could grasp any body in his hand, and could write; and the muscles were evidently becoming more plump. He then ceased to attend, and did not re-appear until the 2d of October, when, not being able to assign a satisfactory reason for his absence, and as he had all the appearance of having been drinking much, he was discharged for irregularity. He was not so well, when discharged, as on the 24th of September, when he ceased to attend.

CASE XXIV.

Charitable Infirmary, Jervis-street,
August 26, 1826.

Two patients labouring under paralysis, from pressure on the nerves in their course, applied this morning. One of them was a pedlar, and the paralysis, which affected his arm, was caused by his carrying a load on the end of a stick placed over his shoulder. The other was a labourer, and, in his case, the paralysis was confined to the flexors of the fore-arm, and had been produced by a board falling on the front of the elbow joint. Neither of these patients had any pain.

A Moxa was applied to the shoulder of the pedlar, near the root of the neck; and one to the fore-arm of the labourer, near the elbow. The power of motion was immediately much increased in both cases. These patients did not return to the hospital; but I feel quite certain that this was owing to the one application having produced a restoration of the injured parts.

CASE XXV.

Charitable Infirmary, Jervis-street,
September 4, 1826.

James Rosseter, a delicate child, aged six years, from 5, Mary's-lane,

Has total loss of hearing from having been exposed to cold, after his head had been shaved, which was rendered necessary for the treatment of a wound on the scalp. The child had been in the hospital, and it was after his discharge that the loss of hearing came on.

A small Moxa behind each ear restored his hearing, after blisters had been used in vain.

CASE XXVI.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
September 5, 1826.

Eliza Reed, aged 17, daughter of a silk weaver, Earl-street, Liberty.

The vision of the left eye is so feeble, that she can merely distinguish light from darkness. Her incapability of seeing objects appears to her to arise from innumerable black lines in front of her eye. The eye does not differ in appearance from the other eye, except in the vessels of the conjunctiva and schlerotic being dilated, and very serpentine in their course. The pupil dilates and contracts from the influence of light. Her mother says, that the present state of the eye succeeded an inflammation, which had lasted several weeks.

Four small Moxas were applied in the hollow of the left temple : an interval of seven days being allowed between each. The hot bath was frequently used, and while she was in the bath, cold water was pumped with force against the morbid eye and corresponding side of the head. She was discharged cured on the 14th of October. The *immediate* influence of both the Moxa and the bath was very remarkable. It uniformly happened, even in the early stage of the treatment, that their application was instantly followed by a great improvement in the power of vision, by the removal of the black lines for a time, which were replaced, so long as they remained away, by a cloud. In the course of the treatment, it was found necessary to remove blood from the head, by cupping in the neck, for the relief of a giddiness which she frequently felt; and which, on one occasion, was so severe as to cause her to fall. It was afterwards relieved by a spontaneous hæmorrhage from the nose, which appeared to hasten the restoration of her sight.

CASE XXVII.

Infirmity for Rheumatic and Cutaneous Diseases, Moore-st.
September 2, 1826.

Barney Coyle, aged 54, a labourer from Dunleary,
Complains of incessant noise in both ears, particularly in the right. The noise he compares to the hum of a bee-hive. He cannot distinguish any other sound with the right ear, and the hearing of the left is very imperfect. He attributes the complaint to exposure to wet and cold. Has been labouring under it for twelve months, and is progressively getting worse. Has used blisters and

a variety of other applications to his ears, without benefit.

Two small Moxas applied behind each ear, and the daily use of a hot bath conjoined with the aspersion of cold water on the head while in the bath, removed, in less than a month, the noise from both ears, improved the hearing of the right, and perfectly restored that of the left ear.

If the views which have been taken in the preceding pages of the immediate cause of functional disease, and of the difference between continued and intermittent morbid actions, be founded in nature, it will follow that, of all diseases likely to obtain benefit from the application of Moxa, epileptic or spasmodic affections, when they have become chronic or inveterate, hold the foremost rank. These diseases are, in fact, remarkable for their intermittent character; and, although the brain or spinal marrow, which are their immediate seat, may be, on some occasions, much disorganised; in general, the only derangement of structure of these organs found in epileptics on dissection, is a slight alteration in the diameter of their vessels, with some trifling changes, the consequence of that alteration. Such diseases have, therefore, precisely the character of that class of affections, to which the remedies, whose mode of action has been investigated in the preceding pages, are suited. And had I not already arrived at the limits, which I have placed to the extent of this publication, I could adduce a large collection of epileptic cases in support of this assertion. However, I expect the three following will be sufficient.

CASE XXVIII.

Baggot-street, August 5, 1826.

B. C., Esq. aged 33, of a tall figure, pale complexion, black hair, and grey eyes,

Has been subject to epileptic fits for several years. At first, they recurred only once every three months ; but, during the last year, a week seldom elapses without an attack. The fit, most commonly occurs about the time of his going to sleep. It is uniformly preceded by a sensation of giddiness or swimming, with a noise in his ears ; and if he happens to be out of bed at the time, his sight is much affected : all objects are seen confused, and the flame of a candle appears as if it formed the centre of a large star. On the morning succeeding a fit, his intellects are impaired, his head aches, and a general tremulous state of the entire body continues until the following day.

He attributes the original attack of this disease to dissipation ; but latterly he has led a very temperate life. His general health is good, with the exception of a slight dyspepsia.

Twenty-one applications of the Moxa were made in this case, between the 6th of August and 20th of October, round the junction of the neck with the occiput, and along the cervical vertebræ. On several occasions the deep eschar was produced, and the ulcers formed by their separation, were allowed to discharge, without any attempt being made to heal them. On other occasions, the Moxa was used by the medium of the needle ; and consequently, in these instances, no eschars were produced. The employment of the hot bath was conjoined with the Moxa, and repeated every second day. A *douche* of cold water was applied, each time the patient was in the bath, to the head and along the spine ; gentle laxatives, with the com-

pound infusion of gentian, were used to regulate the bowels, and improve the tone of the stomach.

After the second week of this treatment, which was continued until the 20th of October, no fit occurred, nor has any taken place up to this day, November 20. The bodily strength, and mental energy of this gentleman, is much increased, and he now enjoys uninterrupted health. Several of the ulcers, produced by the Moxa, are still discharging, and I intend to allow them to remain open so long as they will do so spontaneously.

CASE XXIX.

Infirmary for Rheumatic and Cutaneous Diseases, Moore-st.
August 2, 1826.

Richard Murphy, aged 48, residing 54, Bride-street, by trade a carpenter; a tall, healthy looking man, with a fair sanguineous complexion,

Labours under a spasmodic disease of the right superior extremity, characterized by the following symptoms. It occurs in paroxysms: the fit commences in the hand, which, having been for a short time convulsively moved or jerked about, soon becomes fixed in a state of permanent flexion: the flexion being either direct, or with a degree of lateral inclination. The convulsive motions, quickly extending up the limb, are soon followed by a rigid flexion of the fore-arm; and the spasms then advancing higher, rapidly arrive at his neck, drag his face towards his shoulder, cause a lateral inclination of his head, and pulling his mouth open, are followed by either a sense of constriction, or of a ball in his throat. These symptoms are preceded by a feeling of sickness and weakness, and followed by an inclination to sleep.

The first attack of this disease occurred two years ago, the second in the February following, the third in March, the fourth in May, the fifth in June, the sixth in November, and the seventh in the beginning of last June. Until the last, none of the attacks continued longer, at the utmost, than two days. On the occasion of each attack, he generally had from two to four paroxysms: each paroxysm lasting about ten minutes, and recurring after an interval of a few hours. On the occasion of the first attack, the spasmodic motions did not extend beyond his hand; but, in each of the succeeding attacks, they gradually ascended higher and higher. Since June last, he has not been one day without a paroxysm; and in the course of the last twenty-four hours, he has had not less than five. During the last paroxysm, which occurred this morning, the convulsive affection extended slightly to the entire of his right side; and he does not remember any thing which occurred after it had ascended to his head. He says "he slept it off," and his son, who accompanies him, and who appears to be an intelligent boy, says "he frothed at his mouth, and worked in his belly during the fit, like a pair of bellows." The patient reports, that he can stop the paroxysms, if he be able to get any one to grasp his hand, the moment he feels the attack, and hold the limb so firmly as to prevent its motion. This however, he says, requires great force, and he adds, that his boy was once hurt in the attempt.

He cannot attribute this disease, in its original occurrence, to any cause; but he is certain that, up to last June, he could observe that every attack was preceded by exposure to cold or wet. Since June, he has not been able to prevent the paroxysms, with all the care and attention he could give to himself. During the intervals of the paroxysms, which occurred prior to last June, his health

was perfectly good, with the exception of a weakness and constant trembling of the right hand, fore-arm, and arm. At present, he is never free from some uneasiness in his head, and his hand is so weak that he is unable to work. The entire extremity trembles exceedingly, and, particularly, when he attempts to extend it from his body.

This man remained under treatment two months, when discharged he was free from all complaints, and the strength of the limb fully restored. Eight Moxas were applied, at different periods during the treatment, along the spinous processes of the cervical vertebræ, and along the junction of the occiput with the neck. They were preceded by cupping and purging, which I repeated three times a-week, until all uneasiness of the head, and all tremulous motion of the extremity, in the intervals of the paroxysms, had subsided. The hot bath and the *douche* of cold water to the head and spine were employed, every second day, during the entire of the treatment. The paroxysms became less and less frequent, and more and more limited to the hand and fore-arm, and then ceased.

November 28—I have seen him this day; he has not had any paroxysm for seven weeks. He has not been under any treatment for the last five weeks, if the discharge after the separation of the eschars be excepted, and this is allowed still to continue.

CASE XXX.

Summer-hill, July 7, 1826.

This evening, at nine o'clock, I was called to see the son of B. C. Esq. aged fourteen years. On entering the bed-room in which the boy was, I found him apparently in a kind of restless sleep. He lay on his left side with his lower limbs drawn up, and frequently moved his arms as if not quite comfortable. His face was slightly flushed,

his eyes were shut or nearly shut, and any attempt at opening them was resisted by him with force, although he did not appear to be at all conscious of what I was doing : his resistance was purely automatic. His eyes, on examination, looked bright ; the conjunctivæ were slightly injected ; the pupils, particularly the right one, were very much dilated. I could not ascertain, satisfactorily, the state of the pulse at the wrist. It was very frequent, very irregular, without any distinct intermission, and might be said to flutter under the finger. His heart beat with violence, the systole and diastole were both distinctly to be felt, but, as it were, conjoined—so closely did the one succeed the other. The heart acted 120 times in a minute. He had discharged his urine and fœces in the bed, and the bolster was stained with a fluid, which had come from his mouth. The skin was moist, his hair appeared damp, and both trunk and extremities felt warm.

From an intelligent female servant, I acquired a knowledge of the following additional particulars :—That the attack had commenced about seven o'clock this evening, having been preceded by some heaviness or disposition to sleep ; that his neck and upper extremities were affected with convulsion, but that the convulsive movements were twitchings, rather than violent spasms, and that they would for a time cease and again recur ; that there was some foaming at the mouth ; that the general surface was hot, the face flushed, and that the whole skin had been covered with a copious moisture ; that, for a time, the left leg had been cold, but the right warm ; that, occasionally, he appeared to be sensible of his state, and that his eyes seemed to follow any one who spoke to him, yet he did not speak ; that during the convulsive movements, his heart had beat with great force ; that he had been as well as usual during the day, and that he had not

complained of any uneasiness prior to the paroxysm ; that the convulsive movements had gradually subsided, and were followed by the state in which I saw him.

I ordered some powders of calomel and scammony, and directed that they should be given, as soon as he appeared able to swallow, and that they should be repeated, at intervals, until copious evacuations were produced.

On the following morning, I found that the symptoms of the preceding night had all subsided. I was informed that, in the course of the night, he had vomited his dinner unchanged, which had been of roast beef ; that the powders had caused only one watery stool ; that, on awakening in the morning, he was somewhat delirious and violent, and that he did not appear, for some time, to know those who were about him. He was however, when I saw him, perfectly quiet, but rather fatuitous in his mode of expression. He complained of pain in the region of the stomach, and in the head ; he had thirst, his abdomen felt tumid, but his tongue was not foul : pulse 84, and very feeble.

I was now surprised to hear, for the first time, that he had been paralytic of his lower limbs for six months, and that he had been already under the care of two other practitioners. On examining the limbs they appeared full, well nourished, red and firm ; and I could not discover the least unnatural projection or deviation in the direction of the spine. Having got him out of bed, he could not stand without support ; and when he attempted to walk, he was unable to do so even with the assistance of a hand, and complained that the attempt produced great pain in the hamstrings. I was also informed that the fit, in which I saw him, was the fourth which he had had ; and that each had been followed by a state of fatuity, which lasted for some days. A convulsive paroxysm preceded

the first symptoms of paralysis, and it was only very gradually that it had arrived at its present degree.

The abdominal discharges being much out of order, a system of purgation was pursued for about a fortnight. At this time the evacuations had acquired a more natural appearance, but no improvement had taken place in the state of paralysis. On the 30th of July, he had a convulsive fit, which was, as far as I could ascertain, exactly like the one above described. The Moxa, which had been before objected to, was no longer delayed. It was applied once a-week on each side of the spinous processes of some portion of the spine; and, in the interval of each application, about three ounces of blood were taken away from the region of the back or loins by cupping. The hot bath was daily used, with the aspersion of cold water on the head and along the vertebræ. The bowels were regulated, and mild antimonial remedies were administered to act on the skin.

The success, which attended this treatment, was remarkable; before six weeks had expired, this young gentleman who had been for half a-year before I saw him confined to his bed or sofa, or at best to creeping about the room on his knees, was restored to the fullest use of his limbs. No convulsive paroxysm occurred after the application of the first Moxa, nor was there the slightest interruption in any respect to his progressive improvement. I think it necessary to mention, that he had been attended before I saw him by two of the first practitioners in town: by each for a period of two months. It is, therefore, unnecessary to say, that all ordinary measures had been tried, before the Moxa was applied.

EXPLANATION OF THE PLATE.

- FIG. 1. The Porte-aiguille:—*a*. The handle made of silver, is hollow, and holds a stock of needles of different sizes.—*b*. The Porte-aiguille, made of steel. *c*. A needle grasped by the Porte-aiguille, and made firm in its situation by the slide *d*. If it be necessary to use a needle of considerable length, a portion of it is made to pass into the handle *a*, through a hole in that end of it which corresponds to the Porte-aiguille; and when we wish to disengage the Porte-aiguille from the needle, this is easily done by pulling the slide *d* towards the smaller end of the instrument. The entire is about five inches in length. See pp. 71-2. This instrument may be had at Mr. Kennan's Artist's Warehouse, Fishamble-street.
- FIG. 2. The instrument for the application of evaporating lotions.—*a*. The pillar of such a height, as will enable the branches *b. b. b.* to clear the surface of the bed, in which the patient lies. The branches, by means of a telescope joint, may be made longer or shorter, according to the situation of the part to which the lotion is to be applied. *c*. A lamp which is used, when it is necessary that the fluid should be of a higher temperature than that of the atmosphere. *d*. A case made of tin, sufficiently large to contain a wine bottle, and, at the same time, allow the interposition of a small stratum of water. The bottle is raised from the bottom of the tin vessel by small supports; and its neck is grasped by the upper branch of the pillar. A number of skeins of cotton, immersed in the bottle, and afterwards made to hang over the part, to which the fluid is to be conveyed, serves to conduct the lotion to the part in drops; and by increasing or diminishing the number of the skeins, we may increase or diminish the number of drops.—See pp. 55, 60. Instruments of this kind may be had at Mr. Daniel's tin factory, Mary-street.
- FIG. 3. The Moxa-Forceps, with a Moxa surrounded by a bit of flat silver wire. See p. 68.
- FIG. 4. A scarificator, of the form used by Baron Larrey.—Instruments of this shape may be had at Mr. Thompson's, Surgical Instrument Maker, Dame-street.
- FIG. 5. A blow pipe.
- FIG. 6. A glass tube.

FINIS.

By the same Author,

RESEARCHES
RESPECTING THE MEDICAL POWERS

OF

CHLORINE GAS,

PARTICULARLY

IN DISEASES OF THE LIVER,

WITH

AN APPENDIX CONTAINING A DESCRIPTION OF THE APPARATUS USED FOR
ITS ADMINISTRATION,

ILLUSTRATED BY PLATES.

Second Edition, with Additions.

AN

ACCOUNT OF THE

APPARATUSES

FOR THE TREATMENT OF

RHEUMATISM

AND

DISEASES OF THE SKIN,

WHICH HAVE BEEN CONSTRUCTED AT THE

DUBLIN SKIN INFIRMARY,

ILLUSTRATED BY NUMEROUS PLATES IN 4TO.

Second Edition.

OBSERVATIONS

ON

SULPHUREOUS FUMIGATIONS,

AS A REMEDY IN

RHEUMATISM

AND

DISEASES OF THE SKIN.

TO
BARON D. J. LARREY,

SURGEON-IN-CHIEF TO THE HOSPITAL OF THE ROYAL GUARD;
INSPECTOR-GENERAL IN THE SERVICE OF MILITARY HEALTH;
FIRST SURGEON OF THE GRAND ARMY IN RUSSIA, SAXONY, AND
FRANCE, DURING THE YEARS 1812, 1813, 1814;
HONORARY MEMBER OF THE BOARD OF HEALTH FOR THE ARMY;
COMMANDER OF THE ROYAL ORDER OF THE LEGION OF HONOR;
CHEVALIER OF THE IMPERIAL ORDER OF THE CROWN OF IRON;
MEMBER OF THE INSTITUTE OF EGYPT, OF THE ROYAL
ACADEMY OF MEDICINE,
&c. &c.

To whose writings the Moxa is indebted for its present
rank on the Continent of Europe, the following pages
are inscribed by

THE AUTHOR.

Gardiner's Place, Mountjoy-square.

ERRATA.—In page 140, line 18, for *hæmorhage* read *hæmorrhage*.

Page 143, line 6, for *is* read *are*.

Folios of pages 101, 102, 103 and 104, have been repeated by mistake of the printer.

ESSAY
ON
THE EFFECTS OF IODINE
ON
THE HUMAN CONSTITUTION;
WITH
PRACTICAL OBSERVATIONS
ON ITS USE IN THE CURE OF
BRONCHOCELE, SCROPHULA, AND THE TUBERCULOUS
DISEASES OF THE CHEST AND ABDOMEN.

By W. GAIRDNER, M. D.

LONDON:
PRINTED FOR THOMAS AND GEORGE UNDERWOOD,
32, FLEET STREET.

1824.

INTRODUCTION.

THE medicine which forms the subject of the following treatise has been so lately introduced into practice, that few Physicians are acquainted either with its properties, or with the manner of using it. Almost all have heard of its effects in discussing bronchocele; and some, rashly presuming that it cannot be a drug of great power, have prescribed it without giving themselves the trouble of making any inquiry into the manner of employing it, or the dangers to which its use is liable. I have thus seen more than one Physician seriously injured in his reputation; and I have seen many patients irrecoverably injured in their health by this subtle and powerful medicine.

Not long since I was informed by a Physician, of great and deserved eminence, in London, that he had prescribed it to the extent of ten grains at one dose to a young woman. Most fortunately she was saved by vomiting. About a year ago, I was consulted on account of a young lady in the last stage of tubercular pulmonary consumption. She was attended by a Surgeon, who had bled her to a most unaccountable degree. This gentleman proposed to me the use of digitalis, which being objected to, he then proposed successively the use of hemlock and iodine. It was plain that he was about as well acquainted with the virtues of one medicine as with those of the other, and not better versed in the history of the disease he was treating. When a medicine of so much power is thus in the hands of every person, I trust I shall not stand in need of apology for having made public the following little treatise. Its materials have been for some time in my possession; and I was desirous of

delaying yet a little the publication of them; but certain statements have gone forth to the world, of the great benefits to be derived from the use of iodine, while the history of its dangers has been most unaccountably withheld. It is in order to fill up this hiatus, and at the same time to direct particularly the attention of Practitioners to the proper manner of using it, with a view to its good effects, that this essay is written.

Particular circumstances have afforded me opportunities of seeing this medicine extensively used; and at the same time of witnessing the bad effects which resulted from the prodigal manner in which it was first employed. I have also made inquiries respecting its history in countries which I have not visited. The answers I have received have not been so detailed and satisfactory as I could have wished: they have all, however, more or less confirmed the observations I have made myself,

or which have been communicated to me from different parts of Switzerland and France.

Some persons may, perhaps, desire to see a daily report of the different cases to which allusion is made in the following pages ; but this would not have been consistent with my plan, which is rather at the present time to present an essay than a treatise to the public.

Bolton Street, Piccadilly, 4th Dec. 1823.

ESSAY

ON THE

EFFECTS OF IODINE.

THE discovery of specific remedies has always, and most justly, been considered one of the most important benefits to be conferred on the practice of medicine. Much dispute has been carried on respecting their nature, but all are agreed about their existence. They have been defined by Dr. Young to be medicines which cure diseases, “without any perceptible connexion between the immediate effect and the benefit obtained.” While their operation is thus obscure, the mode of their employment, and their peculiar virtues, must be subjects of much doubt and uncertainty; while the accidents to which they are liable, in common with other medicines, must occasion great embarrassment and perplexity. But from the moment their *modus operandi*

can be connected with any known general law of the constitution, a great part of these doubts disappear, a light is afforded for directing their good effects, and a clew is obtained for tracing their injurious properties, and applying the necessary antidote. The medical history of iodine will fully exemplify the above observations.

This medicine was first introduced into practice by Dr. Coindet of Geneva. Whilst making researches for other purposes, he found that the *fucus vesiculosus* had been recommended by Russel in the cure of goitre. From this plant, and other species of the same family, the soda, with which iodine is generally found combined, is extracted. As the sponge, whose virtues have long been established by certain experience at Geneva,* is also a maritime plant,

* The total inefficacy of this medicine in the hands of British Practitioners, while its virtues are so palpable and evident at Geneva, that not only Physicians, but also the inhabitants in general, are convinced of their reality, had always surprised me. I was at a loss to account for testimony so contradictory. It seemed as if medicine were a science so uncertain and futile, that its plainest

Dr. Coindet suspected that iodine might be the active principle of them both ; and by this analogy he was first led to employ it in the cure of bronchocele. The success which attended its use in the first instance was very remarkable ; and it seems to have been exhibited cautiously and warily, for some considerable time had elapsed before the alarm was given of its noxious effects.

facts depend more on the authority of name than on the substantial evidence of observation and experiment. I lately obtained an explanation of this difficulty from a quarter in which I can place implicit reliance. It seems that the chemists are much in the habit of substituting charcoal for burnt sponge, of which an undeniable proof is the fact, that burnt sponge is sold at an inferior rate to the same article before it has undergone the process of combustion. — I may also be allowed to state in this place, that I have sent prescriptions for the hydriodate of potass to several chemists in London—that my prescriptions were said to have been made up ; but that a few days afterwards, when I called at their shops, in order to examine the medicine, I discovered that they were not even aware of the existence of such a drug. If such frauds continue to be committed with impunity, the sick had better submit patiently to their pains, than have recourse to physicians, whose science is rendered unavailing for the profit of tradesmen.

It may easily be imagined, with what joy the discovery of a certain remedy for bronchocele was received in a place where that disease is extremely common. Many used it, and many were delivered from their unseemly and most inconvenient malady. But this state of things was not of long duration. Familiarity with the remedy begat too great liberality in its use, the effects of which were speedily apparent.

Iodine was then looked upon as a specific remedy for goitre. Its effect upon the system was little known and little attended to. No person seems even to have considered how it produced its astonishing results. Its efficacy, however, in the cure of goitre, was soon generally recognised. Its reputation flew over the city and neighbourhood of Geneva, and it was taken with the utmost levity, with and without medical advice. Dr. Coindet justly deplotes this abuse, which was the cause of the unmerited discredit into which the remedy afterwards fell. When it had been used for some time in this manner, its pernicious effects began to show themselves ; several persons paid for

their temerity with their lives, and many were irreparably injured in their health. Every day brought to light some new catastrophe, the effect of iodine ; and in the course of a short time its name was associated with the idea of a most intractable and virulent poison. Neither patient nor physician dared venture on its employment. It seemed to be one of those benefits held up to invite the appetite, while its use was denied us.

These melancholy consequences of its indiscriminate and lavish employment, show that iodine is a medicine of great power, and teach the necessity of watching and studying its operation. Nothing can assist us more in forming an accurate estimate of its virtues than a careful observation of the bad effects which flow from its abuse ; and we shall now, therefore, proceed to consider them in detail.

SOME time after the introduction of iodine into practice, a few cases of severe spasm-

dic affection of the stomach and bowels occurred. They were attended with violent and incessant vomiting, excruciating pain of stomach and bowels, strong spasms of the back and legs. The tongue was commonly furred, and the bowels sometimes violently purged, at other times obstinately constipated. The pulse was generally extremely frequent, small and depressed—the eyes sunk and hollow—the countenance ghastly and pale. These accidents were usually imputed by the patients to the iodine they had taken. The Physicians by whose advice the medicine had been given, would not allow this origin of the disease, till a repetition of similar cases determined that the sufferers were right. The vomiting, pain of the bowels, and the cramps of the legs, are extremely severe. They are also with the greatest difficulty allayed, continuing sometimes for many days, and renewed during weeks, and even months, after taking food. The legs sometimes swell in the first instance, and afterwards become rapidly thin and meagre. There is another symptom, which, though common

to almost all diseases, is peculiarly the sign of this. The emaciation which attends this irregular action of iodine is so rapid and so extreme as to strike terror into the minds both of patients and physician. A magistrate of Geneva, high in office, robust, corpulent, and of an athletic form, was so much reduced in flesh, that he was not known by his oldest acquaintances. I have seen emaciation, in one case, proceed to such an extent in a short time as is almost incredible. A young English lady, at a boarding-school, at Paris, had for some time been afflicted with goitre. Her brother was prosecuting the study of medicine there. With the characteristic zeal of a young man, as soon as he heard of the wonderful effects of iodine, he determined on making trial of its powers on his sister. He did not find much difficulty in persuading her to become the subject of his experiments, nor did he encounter more difficulty on the part of the French *gouvernante* to whose care she was confided. The remedy succeeded, as usual, in greatly diminishing the tumour; and for some time

no bad effects were apparent. A small hard knot only remained in the situation which had been occupied by a considerable swelling before; and the desire to get rid of this little tumour was the cause of the remedy having been pushed too far. Its deleterious effects first showed themselves by gnawing pain at the upper part of the stomach, great anxiety, and oppression. These symptoms were disregarded, and the remedy was persevered in for a week longer, during which time the patient became very much emaciated; she was frequently affected with vomiting, the pain of the abdomen became more frequent and more severe, and the thirst was very distressing. I was sent for early in the morning, in consequence of an alarming diarrhœa, which had come on during the night, and I found her in a deplorable condition indeed. Her brother, and the mistress of the boarding-school, were so alarmed at the consequences of their conduct, that they were quite unfit to give any advice about her treatment; they could hardly indeed give me a coherent account of what had passed;

and the poor young lady was therefore entrusted to the care of servants. She was then suffering the most excruciating pain at stomach, violent cramps, and convulsive action of the muscles of the arms, back, and legs, from which she had scarcely any intermission. The vomiting and purging were almost incessant. The dejections were bloody, slimy, and very scanty, but at first had been copious and feculent. The matter vomited was of a dark green colour, streaked with blood. The tongue was loaded with a thick crust, resembling in colour the matter vomited. The countenance was pale, contracted, and with that peculiar expression which announces abdominal suffering. The pulse was small, hard, and frequent, scarcely indeed to be numbered. The whole appearance of the patient was such as to excite well-grounded fears for her life. Being quite unable to swallow, four grains of opium were directed to be thrown into the rectum. They were not, however, long retained, and were not productive of benefit. An anodyne embrocation was therefore applied to the

pit of the stomach, fomentations to the feet ; and, as soon as it could be got ready, she was placed in a warm bath. This so much quieted the irritation of the stomach, that she was enabled to swallow about thirty drops of laudanum, from which there was a decided alleviation of her sufferings for nearly an hour. During ten days she remained in a very doubtful state, subject to frequent severe attacks of diarrhœa, with intense pain of the bowels. Her emaciation during this time was most extraordinary. The expression of her French nurse, “ *décharnée*,” was literally applicable to her ; her arms and body were almost fleshless — her breasts, which had been large, were now perfectly flat — the calves of her legs had quite disappeared — and her thighs were not much thicker than her wrists, when in health. I never witnessed any thing like such extenuation in so short a space of time. By the steady and very liberal use of opium, she recovered to a certain degree ; but when I last saw her, many months after her illness, she remained subject to frequent violent spasms of the stomach,

during which opium alone gave her relief. Her nervous system had been much shattered. She repeatedly declared to me that she seldom enjoyed an hour's respite from the most wretched depression of spirits, and since her illness had never felt any thing like her former buoyancy of mind. The few moments of ease she knew were purchased by large doses of laudanum, to the habitual use of which her sufferings had forced her. She was still very pale, and her emaciation, though much less, was yet very great. She was indeed a miserable monument of the effect of iodine. I heard of this young lady a few weeks ago; she was then much better, had in a great degree recovered her looks, and was able to leave off the use of opium almost entirely. Her stomach, however, still remained very weak, and obliged her to be very careful of her diet. The bronchocele had not returned; but the small hard swelling mentioned above remained still very sensible to the touch, but not evident to the eye.

These are the outlines of a very severe

case. I trust that such a one is not likely to occur soon again. But if practice so daring as I have more than once witnessed in London be repeated, we may very soon see even worse accidents than the above. These statements, however, are important, inasmuch as they demonstrate that iodine is not merely a medicine of specific power against bronchocele, but that it dissipates this disease, by virtue of its very important action on the whole absorbent system. I shall take further notice of this property in a future part of my paper.

There is an effect of iodine to which I have alluded in the case just quoted, but which is so extremely common, when the remedy has been pushed to an overdose, that it deserves to be noticed at greater length. The anxiety and depression of spirits are so great and persevering as to warrant my considering them as the peculiar effect of iodine, and not the consequence of the great debility which attends the violent and inordinate action of this medicine on the constitution. It is an affection very different from hypochondriacal melancholy,

inasmuch as it dwells principally on the present and has no reference to the future. Patients have generally described it to me as a sense of sinking and faintness, which were peculiarly oppressive, and I have heard them complain of it while suffering the most intense pain, as the part of the complaint which was yet the most difficult to bear. This symptom is an almost constant attendant on the violent action of iodine on the system, and frequently makes its appearance in a lesser degree when the medicine acts in a kind and salutary manner.

We have now to notice the effect of iodine on the nervous and muscular systems, and this is by far the most interesting part of our paper. It is that also on which the greatest degree of doubt and uncertainty rests.

The nervous and muscular systems are peculiarly exposed to the irregular action of this medicine. In certain persons, indeed, of peculiar habits of body, it cannot be exhibited so as to affect the constitution in any manner, without in some shape or other producing unpleasant nervous symptoms,

such as dimness of vision, indistinct hearing, fallacious touch, insomnia, breathlessness, palpitation, and all the countless forms of inward nervous derangement. But the symptom to which we shall more peculiarly confine our attention, is a degree of tremor which generally comes on when the patient is under the full constitutional influence of iodine. This symptom may be reckoned a good gauge of the degree of nervous excitement which has taken place, and it is seldom or never absent when that excitement has proceeded to any considerable degree. It generally begins by a slight trembling of the hands, resembling that which takes place from the poison of lead; and if the medicine be incautiously continued, the larger muscles of the arms, legs, and back become affected. When in this state, the patient can with difficulty walk, and his progression is a tottering uncertain motion. He cannot carry any thing straight to his mouth, but the hand moves in a zig-zag manner, and with difficulty arrives at the mouth at last. This complaint is generally attended with a hurried circulation, and a small thready

pulse. There is commonly great suffering at stomach and confined bowels.* When nervous affection first appears the medicine must be most diligently watched, and if the symptoms seem to increase, its use should be instantly put a stop to. If rashly persevered in, the symptoms I have described above will certainly be excited, and then it is vain to withdraw the medicine; the complaint goes on progressive for weeks and months, even though its exciting cause be abstracted; and when it does at last begin to diminish, the amendment is so slow and gradual that the patient is scarcely conscious of the relief he receives. I saw two cases of this kind with Dr. Peschier of Geneva, in which the patients had suffered more than twelve months, and yet their sufferings had undergone little mitigation. It is of some importance not to provoke a complaint with so much difficulty allayed; and no one who has not seen it can have an idea of the slow and

* I have seen in one case a most obstinate suppression of urine. I merely mention the fact, as I have no reason to believe it to be a common effect of the use of iodine.

imperceptible degrees by which it steals on the patient. Its first advances generally escape his observation as well as that of his physician. A slight trembling of the fingers, quivering of the eye-lids, occasional subsultus of the tendons of the fingers, arms, and legs, are generally the first symptoms observed, and it behoves us to be constantly on the watch for them. I have always obliged my patients to raise an empty glass or any light object to the head. By this means the smallest degree of unsteadiness in the hand will commonly be detected. I recommend a light object to be used for this purpose, because a heavy one tends to give steadiness to the muscles and to disguise the complaint.

This effect of iodine is frequently complicated with the choleric complaint I have already described; but it is evident that their proximate cause is different, since they also exist separately. The nervous affection is most common, if I may trust my observations, in the mobile constitutions of women; at least nine out of ten cases, which I have seen, were in women, and by far the greater

number in young nubile girls. In the latter cases the disease generally excites some hysterical symptoms.

This affection differs from chorea. The patient has no difficulty in keeping the affected limbs steady, if not called upon to exert them, and in general exertion is irksome and painful. Like chorea, however, it is always attended with a constipated condition of bowels. The evacuations, also, are uniformly hard, scybulous, and dark coloured. There is certainly a considerable resemblance between the two diseases, but it would be too much to assert that what has been called their proximate cause, or their nature, is the same. Such an idea, however, has been adopted by more than one physician who has seen these cases along with myself. I mention this, not in order to give weight to the opinion, but in order to give my readers a more distinct notion of the form, which the affection we have been considering sometimes assumes. A statement of this kind is more graphical than many descriptions.

Mr. Orfila, whose industry and ingenuity in the study of poisons are well known, has not neglected to examine and note the effects of iodine when given in a large dose. He gave it to different animals in the quantity of a dram and two drams. They were in general seized with violent and frequent vomiting. When the contents of the stomach were not soon thrown off, or were altogether retained, the poison was much more speedily fatal. The animals do not seem to have been affected with any other very remarkable symptom. It is stated that they were much dejected, and manifested suffering, though they did not howl, were not paralyzed or convulsed, and were not affected with any of the more violent symptoms by which poisons commonly show their action on the living body. It is plain that much light is not thus thrown on the effects of iodine when exhibited as a remedy; yet when considered along with the appearances after death, we still find a certain analogy. The stomach was generally found corroded by small ulcers of a linear form, which had eaten through the mucous coat.

Those parts, also, which were most exposed to the action of the poison, were thinner and more transparent than the others, and were easily torn asunder. The mucous membrane in the neighbourhood of the pylorus was found much inflamed, swelled, and covered with a crust of coagulated lymph.

THE affection of the alimentary canal which we have described above, is plainly to be ascribed to the acrid operation of iodine on its mucous membrane. I have never witnessed it in any considerable degree when this medicine had not been taken internally. But I have seen slight pains of stomach, accompanied with copious bilious evacuations, attend its external use. These never proceed to the degree of violence which marks the internal exhibition. Indeed, it is rare to see them in any considerable degree disturb the comfort of the patient. It is not thus when taken into the stomach. The case of the young lady related above, sufficiently shows its

deleterious influence. I have never seen any disease of the bowels which more closely resembled the terrific descriptions given by the physicians of India, of the sufferings from the cholera of that country. Yet no medicine varies more in its effects than this. Some persons take it in large doses for a great length of time with perfect impunity; while others, from that peculiar, undescribed and unintelligible state of constitution, called by physicians an idiosyncrasy, are speedily and violently affected by very small doses. Mr. Magendie, whose accuracy is well known, states that he had swallowed a spoonful of the tincture, containing about a scruple of iodine, without any bad effect ensuing. A child, also, four years old, swallowed by mistake a tea-spoonful of the same preparation with equal impunity. These are extraordinary instances, for I have received the account of the death of a fine boy ten years old, who did not survive many hours after having swallowed the largest of the above doses. And a strong man who took this medicine, under my own care, in doses of half grains three times a-day for

one week only, was very soon affected in such a manner, that, had the medicine not been immediately interrupted, the most lamentable consequences might have ensued. When this medicine is given internally, and it is often necessary that it should be thus exhibited, it must be used with extreme caution, under the sanction and observation of those who are able to watch its effects, and who are experienced in its virtues.

I have never seen a case in which the mismanagement of iodine proved fatal, and cannot, therefore, say whether its long continued use ulcerates the mucous membrane of the stomach in the human body, after the manner described by Orfila. I have no reason to believe that it does, unless the extreme violence of the symptoms, and the obstinacy of the vomiting, should by some be reckoned proofs of such a state. I certainly, however, am inclined to believe that the last mentioned symptom proceeds from inflammation and occlusion of the pylorus, which Orfila describes as the effect of poisoning by iodine.

It is a much more difficult task to dis-

cover a probable explanation of the manner in which iodine disturbs the actions of the nervous system. The rationale of diseases, even when we are best acquainted with their history, is obscure and unsatisfactory. Here it is better at once to stop short, and confess our ignorance, than, by adventurous speculation and daring theory, lay a foundation for mistakes in practice. This subject certainly presents a fine field for hypothesis, and a tempting one to a theorist. But we leave our readers in possession of the facts, and trust they will not use them with less caution than ourselves. One thing only seems probable, that is by its operation on the brain, either immediately, or through the agency of the nerves, that the effects we are considering are produced. The similarity of this effect of iodine to the mercurial erethismus, so well described by Mr. Pearson, will be evident to all, and is an analogy deserving of attention and study. I have seen many instances of gilders in Paris and Geneva affected with mercurial erethismus, closely resembling the erethismus from the use of iodine.

OUR most important consideration is the cure of these painful affections. In the choleric disease the first remedy of all, and that without which we can have little hope of subduing the disease, is opium. If called early to the patient, before the bowels have yet thrown off their acrid contents, I have generally waited a little before exhibiting opium. I have done this for two reasons: First, that I might be certain of all acrid matters having been removed from the alimentary canal before the prescription of a medicine to quiet its irritation; and, secondly, because it is with great difficulty that the opium is retained while the extreme irritation of the disease is going forward. Emollient and diluting injections will in these cases be found most useful auxiliaries, both by washing out the inferior portion of the gut, and by quieting the violent action of the stomach. Hemlock and hyoscyamus sometimes succeed when opium fails. The case related at page 7 was much relieved, indeed I may say that the young lady's life was saved, by

a quarter of a grain of acetate of morphia given every half-hour. Every other form of opium was tried without effect; they were not even retained an instant on the stomach. The acetate of morphia alone could be taken, and it effectually restrained the disease, which must otherwise have very soon terminated the life of the patient. This medicine has not, however, answered my expectation in other cases. I have tried various bitter and astringent medicines in union with opium, but have found them uniformly injurious during the first stage of excitement and exacerbation. Afterwards, when the disease has in some degree abated, this class of medicine will be found useful. I cannot too strongly caution my readers against the use of purgatives in such cases. However gentle they may be, their effect is uniformly and most decidedly noxious. In the first and acute period of this affection of the alimentary canal, it is almost impossible to quiet the disturbance which a purgative occasions. A remedy which ought never to be neglected is the warm bath. It will be found a most powerful coadjutor in restrain-

ing the violence of the spasms, and in moderating the perturbed action of the stomach.

But the greatest difficulty will be found in treating the second or chronic stage of the complaint, when the symptoms we have mentioned as characterising it are prolonged in a mitigated form. I am inclined to believe, that in this state there is actual ulceration of the mucous membrane of the intestines. I have only seen one case of this kind, of which I have given the history above. But several similar instances have been communicated to me, and they must be of frequent occurrence wherever iodine is used ignorantly and rashly. In all those cases of chronic affection of the alimentary canal, with the particular history of which I have been able to become acquainted, the symptoms differed widely from those which marked the accession of the disease. Instead of the small vacillating pulse of the first period of the complaint, it was bounding and firm, the extremities were no longer cold, nor the system collapsed; the diarrhoea had assumed a dysenteric form, the fæces being retained, and the dejections

consisting chiefly of matured mucus or pus. In such cases, I believe, the conjoined operation of aperient medicines and opium will be found most advantageous in quieting the symptoms. By this plan at least I succeeded best in relieving the single case that has yet occurred to me.

With regard to the treatment of the muscular spasms, and the disturbance of the nervous system, we have before described, there is no invariable plan of cure to be followed. Until we are better acquainted with the nature of the affection, it is impossible to apply a remedy to the root of the complaint. All I can do here, therefore, is to point out the means by which I have best succeeded in averting and palliating its painful symptoms. I have seen ten cases of this kind, and all of them have seemed to be much more benefited by attention to diet, air, and exercise, than by any medicines they have taken. Patients thus affected ought to live much in the open air ; their food should be sparing, mild, and nutritious ; and they ought to avoid carefully the use of wine and

ardent spirits. By these means alone, and the use of mild aperient medicines, two of the cases alluded to were quickly recovered, although they began in a very threatening manner. All the others but one were much relieved by the same means. I therefore consider these simple remedies to be of the greatest importance, and am convinced that without them no other remedies will have any effect. Next in importance to gentle exercise in the open air, and attention to diet, I should place the use of the warm bath. By means of it the severity of the spasms is very frequently relieved. The young lady, whose case is related at page 7, used it daily, sometimes several times in a day, and never without benefit. She could never enjoy any sleep at night unless she had previously spent a quarter of an hour in the bath; and to this day she continues the use of it. Joined to the above remedies, habitual attention must be paid to the bowels. They should be moved by the gentlest medicines, and they may often be advantageously acted on by glisters only. This manner of exhibiting medicine is fre-

quently objected to in England, because it only empties the lower parts of the larger intestines ; but repeated experience has convinced me, that the mere circumstance of evacuating the large intestines gives occasion to, and stimulates the action of, the higher passages. I do not intend to defend the habitual abuse of enemata which is daily witnessed on the Continent ; but, in this country, I think that their use may be extended with advantage. In whatever way, however, the bowels are evacuated, it is of the greatest consequence that they should be acted on by the gentlest medicines possible. Such, however, is their slowness in this disease, that it sometimes becomes necessary to use the strongest medicine in order to effect a mere evacuation ; but I have never seen the bowels violently moved without the highest injury to the patient. My common practice has been to prescribe small repeated doses of one of the neutral salts, to each of which I desire five or six drops of laudanum to be added. By this means it has seemed to me that my purpose was effected with least violence. I have tried all the medicines of

the class of antispasmodics, and cannot speak in favour of any one of them. They are either useless or hurtful. The tinctures and ethers are injurious in a very marked manner and in a very high degree. Various other remedies will, of course, be suggested to the judicious practitioner by the peculiar circumstances of each case.

I MAY seem to some persons to have dwelt too tediously on the poisonous properties of iodine; but let it be recollected, by those who have had opportunities of becoming acquainted with its virtues, that this medicine is as yet almost unknown to the numerous practitioners who are now daily using it; that it is a medicine of singular power and efficacy in a great class of disorders, with which the inhabitants of this country are peculiarly afflicted; that this most useful remedy may be divested of all its deleterious properties; that, therefore, it will probably come into general use among us; and they will allow that I have not bestowed too much time on this important subject. I wish the details

had been more complete, that my experience had been more extensive, and that I had been better able to satisfy the reader's curiosity and my own.

Some of my readers, who have lately been in the habit of using iodine cautiously, and of watching its effects, may think that I have overcharged the picture of its baneful properties ; but I have been an eyewitness of all I have written ; and I should extend this treatise much beyond the limits I have assigned to it, did I detail all the cases that have reached me of the mischief it has produced. I am glad, however, to add my testimony to that of Coindet, de Carro, and others, that this medicine may most certainly be deprived of all its hurtful qualities, by using it cautiously and watching its effect. Like all other powerful medicines, when its action is not controlled by the hand of a master, its energies become a source of mischief and ruin, instead of restoring the blessings of health and strength ; but when well managed, it is a most useful remedy, and a valuable addition to our *materia medica*. I have used it myself in a great number of

cases, and I have never yet, in my own practice, had occasion to regret the occurrence of any of the violent symptoms I have described. I have more than once discontinued the medicine on finding the pulse become frequent, small, and depressed, on account of watchfulness, flying pains of the joints, tremors, or pain at the stomach; but having early detected these symptoms, they were not allowed to become formidable. Dr. Coindet states, that he has prescribed the medicine to one hundred and fifty patients, and that he has never had occasion to observe any mischief from its use.* Dr. Decarro has given it at Vienna to one hundred and twenty patients; Dr. Erlinger, of Zurich, to seventy; and Dr. Formey has prescribed it extensively, in Prussia, with the same favourable results. Dr. Decarro, in his enthusiasm about this new medicine, seems almost to doubt whether any acci-

* Dr. Coindet, however, though he must be acquainted with the sad accidents which have occurred in his native city, has not yet taken any public notice of them. This silence on facts so important seems in some degree to invalidate his testimony.

dents have ever occurred from its use, though these accidents have been as public as the day, and the unhappy patients have paid with their lives the inexperience and rashness of their physicians. Thus far I can agree with Decarro, that I have never known or heard of any bad effect from iodine, when it had not been used unadvisedly and injudiciously. It has been used extensively by Hufeland in Germany, who makes no mention of its deleterious properties; and a great number of physicians in London and Paris, and various parts of England and France, have also lately employed it. They have either not met with the accidents I have described, or have prudently concealed them.

HAVING now considered the effects of iodine on the alimentary canal and the nervous system, we are prepared for studying its effect on the absorbent vessels, by which its use in medicine is indicated. This is the most important subject which has yet fallen under my review, and I shall

give it as much extension as may be necessary for its perfect discussion. It has been already seen at pages 10 and 12 that the lymphatic system is very powerfully and generally stimulated, so as to occasion a great absorption of all the sebaceous, muscular, and glandular structures of the body ; but it will be seen, in the following pages, that the action of iodine may be directed exclusively against tumors, and local disorders, while the healthy structures of the body remain unaffected.

The absorbent system is distributed over every part of the body. In the brain alone the vessels of this class have not, hitherto, been detected and submitted to ocular demonstration by any other anatomist than Mascagni. But physiological and pathological proofs of their existence, equal in force to any anatomical evidence, are not wanting to demonstrate their presence in the central organ of the nervous system. The office which these vessels discharge, in the nutrition of the body and removal of its waste, is most important to its healthy condition ; and the influence it exerts, in a state of disease,

is not less considerable. From the inactivity or obstruction of the absorbent vessels, a great proportion of the chronic disorders of the body take their rise. Medicines, therefore, which act either directly or indirectly on this system, have always been accounted most valuable articles of the *materia medica*. Unhappily, they too often deceive us in their operation, and, notwithstanding the united studies of many physicians directed to them, the causes of their failure, as well as the circumstances under which they succeed, still remain a problem. A considerable step towards the solution of this difficulty has, indeed, been lately taken by Dr. Blackall. Much obscurity, however, yet rests upon the subject, and a direct medical agent on the absorbent system, whose effects are speedy, indubitable, and powerful, is a great desideratum in the art of healing.

Such an agent is iodine. Its effects on the absorbent system are incontrovertible. They are as speedy as they are certain, and so powerful are they, that if the medicine be not duly and cautiously managed, we

have already seen what havoc may be the result. A few, a very few, cases have occurred to myself, in which the constitution was altogether insensible to its action ; I believe a greater number have occurred to others ; but I cannot help thinking that such cases have been owing, in many instances, either to some fault in the medicine, or to some inadvertence on the part of the practitioner.*

We shall first consider the use of iodine in the treatment of bronchocele, the disease for the cure of which it was introduced into practice. All the physicians who have employed it bear unequivocal testimony to its efficacy. It seldom fails of effecting a complete cure, and when it does, it almost always reduces the swelling very considerably. The promptitude of its action is at times very extraordinary. Decarro states,

* The iodine which is sold in the shops is of very different degrees of purity, which will probably afford an explanation of some of the above anomalies. But still, after all possible care has been taken, there will be found a few instances in which it does not appear to possess any power over the absorbent system.

that one of his patients, thirty-eight years of age, after taking the remedy for seventeen days, had the circumference of his neck reduced from one foot seven inches and a half, to one foot three inches and three-quarters. Dr. Coindet relates a case of a man, fifty years of age, in which this medicine, taken internally, reduced a very large goître considerably in size, after six days' treatment only. An old woman, aged sixty-five, who took this medicine under my care for a goître, with which she had been affected nearly forty years, had the circumference of her neck reduced from twenty-two inches to eighteen, on the twenty-fifth day. Such rapid diminution in the size of the tumor is not to be always expected. In some cases a whole month, and even more, elapses before any effect is visible. In general, however, the powers of the medicine are manifest at the end of the second week, and considerable progress towards cure has been made at the end of a month. I have endeavoured to find out whether there was any thing in the constitution of the different persons under my own observa-

tion, or in their state of health, which rendered them more or less apt to be affected by this medicine. I have not been very successful in this inquiry. But I found that in two cases of women afflicted with extensive and very painful varix of the veins of all the extremities, the effect of iodine was produced with great difficulty. This fact seemed to coincide with the result of Mr. Magendie's very interesting experiments on absorption, and I accordingly desired one of the persons, to whom I have just alluded, to lose a little blood from the arm. The effect of the medicine was very much accelerated by this treatment, but a consequence I did not look for was also the result of it, viz. the total and sudden disappearance of the varix, which had commenced during uterine gestation twelve years before. The goître succeeded the varix after her delivery. I merely mention the facts of this case, which may suggest useful hints to those who may meet with a case similarly circumstanced. Since its occurrence, whenever the medicine is slow in its operation,

provided the vessels be full and plethoric, I desire a little blood to be taken away from the arm, and I almost invariably find the action of the medicine much quickened. I have sometimes, also, thought that the cases, in which blood was taken away, were cured more easily and with less suffering than the others.

There is, very rarely, any considerable effect produced on the arterial system by iodine, if it be given with propriety and caution. Sometimes it accelerates the pulse in a slight degree; it frequently occasions a little mucous expectoration from the chest, and it often raises nervous symptoms in delicate subjects, which are very distressing. I saw it given to a young woman in one of the public hospitals in Paris, in whom it produced such a state of insomnia that she told me she had not slept at all for a whole week, though she had been a very good sleeper before. I have said that it affects the pulse but a little, yet it sometimes stimulates very powerfully the arterial vessels of the tumor. This is mentioned by

all the authors who have written on iodine, and is one of the most singular circumstances in its medical history.

This irritation of arterial vessels frequently becomes active inflammation, requiring the use of bloodletting for its relief. Topical bleeding will, in general, be found fully competent to remove it. Indeed, it sometimes happens that when the iodine has lighted up smart inflammation in the tumor, the arterial system generally is unaffected. To what is this effect on the vessels of the part to be attributed, from which the constitution generally is free?

The same is occasionally true of the absorbent vessels. I have seen some very large tumors discussed, while there was no evidence whatever of the absorbent vessels in other parts of the body having felt the influence of the medicine. It is a curious question, to determine by what law the constitution remains impassive to the action of a medicine, which affects remote and distant parts through the constitution. Certain tumors are of so irritable a nature, that a stimulus, which only serves to rouse

the healthy energies of the body, excites the process of destruction in them. In the quaint language of a celebrated modern lecturer, "they are irritable beings, if you touch them they'll kick." But this is not the case with many of the tumors which are dissipated by iodine. Bronchocele, for instance, is of a slow growth; all the operations which go forward in its structure are of a very indolent and chronic kind. Such, also, is the case with the greater number of scrophulous tumors. Yet all of them have been dissipated, like a charm, by the agency of iodine.

In prescribing this medicine, it is very necessary not to lose sight of the effect I have just mentioned. When the tumor is very large, and especially in that kind of bronchocele, in which the principal enlargement of the thyroid gland takes place on its inner surface, where it is in contact with the trachea, the occurrence of inflammation is much to be apprehended. When a very large tumor becomes inflamed, the distress which it occasions, and the disturbance it excites in the constitution, are very consider-

able ; and in the second case to which I have alluded, inflammation of the trachea is very readily excited.* Such cases are easily distinguished by the immoveability of the tumor, and the effect they have in altering the voice. On dissection, the trachea is sometimes found to have been very much compressed by them.

It is now fit that I should mention the most common and beneficial methods of using this substance. Dr. Coindet has recommended the hydriodate of potass as an external application, and my experience has certainly confirmed his choice. The hydriodate of soda, however, will be found to answer equally well. Practitioners may choose between these two remedies. I have used the iodates, but I have found them at once more inert and more unmanageable. They possess all the virtues of iodine in a very remarkable degree, but they will be found to fail more frequently than the hydriodatic salts ; and, if I may draw any

* Dr. Coindet gives an instructive example of this kind. *Bibliothèque Universelle, Février, 1821, p. 148.*

conclusion from the few trials I have given them, they are more apt to excite disorder in the system. I have generally ordered half a dram of the hydrodate of potass to be united to an ounce and a half of axunge, and desired the patient to rub in a dram of this ointment over the surface of the tumor, night and morning. When the tumor is painful, it is not necessary to rub in. The ointment may be used in the manner recommended by Scattigna.* All that is necessary is, to choose a portion of the surface of the body where the skin is very tender and thin, and simply to apply the ointment over night. For this purpose, almost any part of the body which is habitually covered may be chosen; but in the axilla, and in the inner surface of the thighs close to the scrotum, the absorption will be found most rapid.†

* Nuovo metodo di amministrari l'unguento mercuriale ne mali sifitici del Dottore Vitantonio Scattigna. Napoli, 1818.

† I have seen, in the hospitals of Naples, the most decided and unquestionable effects produced by mercury used in this manner, I have since used it fre-

It is a more important question to determine the proper method of using this medicine internally. From my own experience, I am inclined to give a decided preference to the solution over the tincture. It is prepared by dissolving thirty grains of the hydriodate of *potass* in an ounce of distilled water. I have generally begun this preparation by a dose of ten drops, and

quently in my own practice in the same way; and I believe that the mercurial ointment, thus used, is exempt from much of the inconvenience occasioned by rubbing. I have seen several persons use it in this manner with ease, who could not rub in mercury without much suffering. Scattigna asserts that it is also much more efficacious than when rubbed in by the common method. His way of using it is, to extend a scruple of mercurial ointment over the skin of the axilla before the patient goes to sleep. In the morning, the whole of it will be found to be absorbed, and in this way he calculates that as strong an effect is produced as by a drachm of the ointment. I have used, in a case of hydrothorax, an ointment of squills in the same way, which has caused an increased flow of urine, which I had vainly endeavoured to effect by means of the same medicine given by the mouth. These statements are at variance with the experience of Mr. Pearson, which must be allowed to be of much weight in this matter. Will the difference of climate account for the discrepancy?

augmented it gradually to twenty, and, very seldom, to twenty-five. This preparation can dissolve an additional dose of iodine ; a formulary, however, to which I seldom, if ever, have recourse. I have found that the deleterious action of the medicine on the bowels was more marked, in proportion to the quantity of free iodine it contained. For this reason, also, I now seldom have recourse to the tincture, a form much used, because it is less expensive. Practitioners will, in general, find an advantage in confining themselves to the external use of iodine for the cure of bronchocele, and tumors, which do not arise from any vice in the constitution. In a few cases of bronchocele, however, it is necessary to have recourse to its internal use, especially when the disease exists in a strumous habit. By the use, either of the ointment, or of the solution in the way we have recommended, a soft bronchocele will be dissolved in a month or six weeks. Those which are hard, and of old growth, generally take a little longer time, and many of these latter cases cannot be altogether reduced. I have seen two cases, however,

in which the tumors gradually disappeared some weeks after the medicine had been altogether discontinued. Dr. Coindet says, that he has seen several cases of bronchocele, complicated with watery cysts, yield completely to the action of iodine. I have only had occasion to see one such case treated by this medicine. It was somewhat lessened in its bulk, and the patient was certainly relieved, but the disease was by no means cured.

If the iodine be given internally, it is indispensably necessary to watch its effects from day to day. No peculiarity of circumstances whatever can dispense the physician from this care; and if it be recollected that it is yet a new medicine, that unknown accidents, to which it is liable, may be discovered by future investigations, this caution will not appear superfluous. The case related by Dr. Coindet, to which we have already alluded at page 36, in which a very powerful and painful effect was produced at the end of the fifth day, sufficiently evinces the necessity of the watchfulness here recommended.

When iodine acts kindly on the constitution, no other effect will be found to accompany its use, but a diminution of the tumor and a little nervous excitement, which is sometimes not so severe as to become disagreeable. The increase of appetite is a very frequent effect of iodine, and it is sometimes very troublesome, because it is extremely necessary not to indulge it. The diet of the patient should be good, but by no means full, which the occasional voraciousness of his appetite would lead him to adopt.

Having established that the use of iodine in bronchocele was owing to its effect on the absorbent system, it was natural to conclude that it would be of equal service in the cure of scrophula.* Accordingly, we find that

* On perusing most of our practical, and more especially our systematic authors, this term will be found of such latitude and various meaning, that, were they indiscriminately followed, scrophula might be considered an universal disease. In this place, we confine our attention to those diseases which are familiar to all practitioners, scrophulous tumors of the conglobate glands.

Dr. Coindet made trial of it in the cure of the latter disease, soon after he had determined its virtues in the former, and that his experiment was followed by the most satisfactory result. I have already considered at so great length the general effects of iodine on the constitution, that little remains for me in this place but to mention the particular cases in which I have found it useful, and those in which it has failed my expectations.

The first case of scrophula in which I made use of this medicine, was that of a young lady eighteen years of age, who had been affected by glandular swellings of the neck for nearly eight years. She used the solution of hydriodate of potass for a month; the dose varied from ten to twenty drops three times a day, with occasional intermission of a day when the absorption was going on rapidly. At the end of this time she had got perfectly rid of her swellings, and she now (two years since she took the medicine) remains perfectly well. When she discontinued her drops, so far from having been incommoded by them, her

health was certainly much improved. There remained several little fistulous sores, which required the assistance of the knife to heal them. The iodine is not equally efficacious in all cases of this kind. Great numbers, however, yield rapidly under its use; but many of them, also, resist its operation. I have never been able to assign even a plausible reason for this difference of its action in scrophula. In general, I have found such cases yield more readily to the internal than to the external use of iodine. The scrophulous glands of children are not so easily affected by iodine as those of persons who have attained the age of puberty, and they are also more liable to a relapse.

A female servant in one of the public hotels of Paris, aged thirty-three, married, who had born several children, shewed me a tumor of her right breast she had had about two years. It was not attended with any pain, but had lately somewhat increased, which gave her alarm. About a year before she had been advised by a surgeon to have it cut out. This advice gave her so much uneasiness, that she presented herself at the

clinical consultations of M. Dubois. That eminent surgeon immediately distinguished the tumor to be scrophulous; and during three months' treatment, all the usual remedies of this disease were exhausted without the least effect. A scruple of the ointment of the hydriodate of potass, placed in the axilla at night, completely removed the tumor in about six weeks. This is the only case of a similar kind in which I have used iodine. I have never yet employed it in scirrhus of the breast.*

I was called in the month of February, 1822, to visit a boy five years old, affected in the following manner. Since the period of his birth, he had always been weakly, but,

* My friend Mr. Maunoir, of Geneva, informed me that a little boy from one of the interior towns of Switzerland, was brought to him on account of a swelling of the knee-joint. He had already been under the care of several eminent surgeons, who had all declared the tumor to be a white swelling, and had recommended the amputation of the limb. Such, also, was the opinion of Mr. Maunoir; but finding the friends and the boy himself extremely averse to the operation, he tried the effect of iodine. In the course of a few weeks the tumor, pain, and stiffness of the joint were dissipated, and the boy was running about as formerly.

for the last two years, had gradually been falling off in his flesh and strength. He complained of frequent pains in his bowels, which were alternately confined and purged ; the motions were discoloured and scybalous ; he frequently vomited his food ; his abdomen was much swelled ; the rest of his body considerably emaciated ; pulse natural ; appetite variable, but never great. It was impossible to doubt, from the appearance of the child, that the mesenteric glands were enlarged, and I determined to make a very cautious trial of iodine. It was the first case in which I had used it for an internal disease, and I therefore watched it with unremitting care. I began by giving my little patient twelve drops in the day, which I gradually augmented to twenty, and I had the pleasure of seeing the abdomen gradually diminish in size, the bowels become more regular, the evacuations restored to their natural colour, the pain diminish and vanish, the appetite increase, and at the end of five weeks the child return to comparative health, without the occurrence of a single untoward symptom. The only medicine I employed during this treatment, besides iodine, was occasionally a few

grains of rhubarb. At the end of the five weeks the bowels acted without medicine. I am sorry to say that I lost sight of this child from this time. The parents were poor, were probably satisfied with the benefit they had received, and not willing to incur any farther expense for medicine. I have since prescribed this medicine in two other cases of disease of the mesenteric glands. The result was not so satisfactory as in the case I have just related, but both of them were considerably relieved, and had they been more attentive to the directions given them, I have little doubt that they also would have obtained a complete cure. But they were in the poorest class of society, were irregular in their habits, and paid very imperfect attention to the orders of their physician. In one of them, a young woman, fifteen years old, after she had taken fifteen drops of the solution of hydriodate of potass, twice a-day during three weeks, considerable tenderness of the whole abdomen came on, for which I judged it necessary to order the application of a dozen leeches. The relief was immediate. From the whole appear-

ance of the case, I judged this feverish attack to be an affection of the mesenteric glands, similar to what I have described at p. 39.

I have used this medicine in cases where I had good evidence of the presence of tubercles in the lungs, and I do not doubt that it will be found to be serviceable in the incipient stages of the disease. But I much question whether it will prove even innocent in the more advanced periods of tubercles, when extensive disorganization has taken place in the lungs. Some cases in which I have prescribed it, were benefitted in so marked a manner as to have inspired me with hopes of having at length found a remedy for that hitherto intractable and cruel malady. Other cases, on the contrary, seemed to be much aggravated by its use. If I may judge from the cautious expressions of Dr. Baron, in his work on tuberculous disease, this is nearly the result of his experience also. It is much to be desired that we had sufficient data for distinguishing the cases in which its use is beneficial, inert, and injurious. As yet, the results I have

obtained do not entitle me to come to any very definite conclusion on this subject. Mr. Haden, in his translation of Magendie's *Pharmacopœia*, has given the history of a case of affection of the chest, in which he seems evidently to think that tubercles were removed by the agency of iodine. I am glad to find this case stated by Mr. Haden with his characteristic candour and caution. It is much to be desired that a series of such cases were published. They would form the materials on which a just estimate of the powers of this medicine might be formed. I trust to be able, at no distant period, to give the result of my experience in this disease to the public, in such a manner as to establish what are the real virtues of iodine in the cure of pulmonary tubercles. At present, there is certainly sufficient ground for making a cautious trial of its powers; but, if I may trust to my own experience, it is impossible to use it with too much circumspection.

A young gentleman, aged twenty-six, who had passed four winters in the south of Europe for a cough, with pain in his chest,

and occasional expectoration of a thick matured discharge, frequently streaked with blood, consulted me on account of swelled glands in his neck, which he had had from his infancy, but which were at that time particularly troublesome. I desired him to use a solution of hydriodate of potass in the dose, of twelve drops three times a-day. In the course of two months, the swellings in the neck, which had pained him from his infancy, were quite dispersed, and at the same time his sufferings in the chest were so much diminished that he requested to be allowed to continue the medicine. I allowed him to use it a fortnight longer, at the end of which time he was quite free from complaint. He subsequently had another attack of his chest complaint, and wrote to me from Thoulouse to request directions for renewing the use of the medicine, under the care of a French physician. Before my letter reached him, he was carried off by an attack of some violent complaint, of which I never could learn the history. I have exhibited this medicine in several such cases, and frequently with the

most marked good effects. In fine, I have not the smallest doubt of its efficacy in relieving many diseases of the chest, in which all the general symptoms, as well as all the local means of exploring the condition of the lungs, which have lately been so much attended to in France, have given me the most satisfactory evidence of the presence of tubercles. I will not yet assert, however, that the use of iodine has been followed by the absorption of tubercles in the lungs. This important fact must not be affirmed hastily ; but I trust I shall be enabled, at a future period, to establish it to the satisfaction of every one, or to explain the beneficial action of the medicine on other grounds.

Dr. Baron, in his work already quoted (p. 221), has related a case of encysted dropsy of the ovarium, in which the use of iodine was attended with the most manifest and rapid benefit. I have seen it used in a case of the same kind, in which a swelling that had been twice tapped, and which then filled the greater part of the abdomen, was almost completely removed.

The patient, a woman of sixty-two, has recovered her strength; she has resumed the appearance of health, and has remained eighteen months free from dropsical symptoms.

I have made trial of iodine in two cases of ascites without benefit. I have also made use of it in a case of amenorrhœa, according to Coindet's advice, without the smallest advantage; nor have I been able to satisfy myself that it possesses any power over the uterine system

CONCLUSION.

THE liability of iodine to excite great disturbance in the constitution, has been made an objection to its use. I fear that this reproach must be shared by all powerful medicines whatever. If unattended to, or used with levity, any medicine which is capable of doing good, may also do harm. But if used with due discretion and properly watched, I have no hesitation in affirming, that iodine may be employed with as much safety as any of the powerful remedies which are daily in the hands of the least skilful members of the profession. But it has been also made a subject of reproach to this remedy that it is quite inert and useless. I shall not give any further reply to such a statement than what the foregoing pages contain. But I am credibly informed that it has been used by several eminent prac-

tioners of London ; who finding it quite inert, had laid it aside as useless*.

I have already pointed out one source of such mistakes (page 3). I fear, however, that it has also been used by physicians who have not leisure of mind nor time enough for conducting such inquiries as they ought to be conducted. When we consider the silly pretences on which medicines are sometimes forced into fashionable practice, it will not appear wonderful that the investigation of their virtues should not be conducted with much zeal. But I know also that it has been hastily rejected, and without trial, by some persons grown old in the practice of physic, who have made their interests decidedly to consist in defending all that is old, and repudiating all that is new. Such persons expose themselves to ridicule when we see them reject a remedy so active

* So great have been the ravages committed by the imprudent use of iodine in the Pays de Vaud, that the government of that canton has issued an injunction against its sale, excepting under the signature and responsibility of a physician.

as iodine, and continue to trust, for the cure of the severest diseases to which the human frame is liable, to medicines allowed on all hands, and even by themselves, to be absolutely useless.

The value of iodine as a remedy, however, does not depend on the testimony of any individual, however high his name. Its use is established by a long series of facts observed by physicians and surgeons of different countries. Wherever it has received a fair trial from unprejudiced persons, its effects have been so striking and undeniable as to force assent. It is not one of those remedies which is adopted by one man, and rejected by another, according to the accident or caprice of the moment; but one whose effects are written in such clear and intelligible characters, that *he that runs can read*. Its applications also are in cases of such common occurrence, that all practitioners have an opportunity of satisfying themselves of the real nature of the remedy, and the extent of its powers.

This medicine has also been called an empirical remedy. Of what importance is

it that it should bear this or any other name, by which the enemies of every thing that is new endeavour to keep others in the same state of happy ignorance which satisfies their own indolence, and answers the demands of the common routine of their practice? But in what respect is it an empirical remedy? Do we know any thing more of the action of a purgative? It is said to stimulate the larger or the smaller intestines, and iodine may be said to stimulate the absorbent vessels; and after we have said this, are we at all wiser than we were before? The only questions now before us, those which alone appear worthy of discussion, are, Do we in iodine possess a remedy for the diseases in which I have said it is useful? and if we do, on which of the living textures does it seem most particularly to exert its action? These questions settled, all the rest is of comparatively trivial importance.

The medicines which exert their action on particular textures or systems are extremely few indeed, and the few we possess are so uncertain in their operations, they are liable to such frequent failures, that sceptical

physicians doubt of their efficacy altogether, and even of the efficiency of medicine. There is something peculiarly gratifying to their vanity in supposing themselves freed from the common errors, and above the credulity of the vulgar. Iodine, however, is not liable to the sneers of such narrow minds. It is a real “heroic remedy” — a true present from the science of medicine to mankind.

APPENDIX.

I HAVE here thrown into an Appendix a brief account of the different preparations of which I have had occasion to make mention. It is chiefly extracted from Magendie's Formulary, which will be found to contain sufficient directions for the chemical and pharmaceutical operations undergone by iodine.

Tincture of Iodine.

Take of Alcohol, of sp. gr. of .842, 1 oz.

Iodine, 39 gr.

Dissolve.

This preparation should not be long kept, as it readily undergoes alteration and decomposition. Alcohol varies in its solvent power of iodine according to its degree of concentration. The frequent opening of the vessels, therefore, in which it is kept, must occasion a change in the quality of the tincture, by allowing the evaporation of the spirit, and thus occasioning a diffu-

sion of undissolved iodine through this preparation. Mr. Magendie seems also to fear, that a decomposition of the alcohol may take place from the superior affinity of iodine for hydrogen. Altogether this is certainly the most objectionable form in which iodine is used.

Solution of Hydriodate of Potass.

Take of distilled Water, 1 oz.

Hydriodate of Potass, 30 gr.

Dissolve.

I have generally prescribed these two preparations in cinnamon or mint water, in which form they are seldom disagreeable to the stomach. I have avoided, as much as possible, joining them to any tinctures or infusions, as we are yet in a great degree unacquainted with the chemical habits of iodine and the different vegetable substances. It will be sometimes, however, found advisable to use tonics with iodine.

Ointment of Hydriodate of Potass.

Take of Hydriodate of Potass, $\frac{1}{2}$ dr.

Axunge, $1\frac{1}{2}$ oz. Mix.

NOTE.

SINCE these pages were put to press, I have received from Professor Maunoir the following details of the case mentioned at page 49. As far as I know, it is the only case of the kind on record. I make no apology, therefore, for inserting it in this place.

“ C’est le 18 Mars 1821, que j’ai été consulté pour la première fois pour le jeune B—— de Soleure, enfant de huit ans, atteint, depuis moins d’un an, d’un *white swelling* au genou droit; pour lequel on avoit employé inutilement vésicatoires, sangsues, topiques résolutifs de toute espèce, remèdes internes, &c. Il avoit alors une augmentation considérable dans le volume du genou, que le médecin supposoit avoir lieu dans les os plutôt que dans les parties molles, et en même tems une diminution sensible dans le volume de la jambe. L’enfant ne pouvoit faire un pas sans douleur avec des béquilles; car il y avoit flexion de la jambe sur la cuisse, je ne sais pas à quel angle, mais impossibilité d’extension.

“ Je l’ai traité par correspondance sans le voir; on lui a fait des frictions avec l’onguent d’iode, gros comme une noisette, matin et soir. Il a pris la teinture d’iode à la dose d’ $\frac{1}{12}$ de grain au plus. Son estomac n’en a été nullement affecté, et huit mois après le père n’a pas pu résister au plaisir de me montrer son enfant. Il me l’a amené à Genève, et j’ai vu cet enfant, marchant et courant lestement, le genou droit de la même grosseur que le gauche, et aussi serviable que celui-là.

THE END.





Ear of Rye attached with "The Spikes."

(The Figures are of the Natural Size.)

Martin's Lithog.

RESEARCHES
RESPECTING THE
NATURAL HISTORY, CHEMICAL ANALYSIS,
AND
MEDICINAL VIRTUES,
OF THE
SPUR, OR ERGOT OF RYE,
WHEN ADMINISTERED AS A REMEDY
IN CERTAIN STATES OF THE UTERUS.

WITH A COLOURED ENGRAVING.

By ADAM NEALE, M.D.

PHYSICIAN TO HIS MAJESTY'S FORCES, AND TO HIS LATE ROYAL
HIGHNESS THE DUKE OF KENT, &c. &c.

L O N D O N :

PRINTED FOR HORATIO PHILLIPS,

(Son and Successor to Sir Richard Phillips,)

Nº 3, CHARING CROSS.

1828.

THE HISTORY OF THE

REIGN OF HENRY THE SECOND

BY JOHN GILBERT FROTHINGHAM

LONDON: PUBLISHED BY J. B. LIPPINCOTT, 15, N. 4TH ST.

NEW YORK: 1854.

THE HISTORY OF THE REIGN OF HENRY THE SECOND

BY JOHN GILBERT FROTHINGHAM

LONDON: PUBLISHED BY J. B. LIPPINCOTT, 15, N. 4TH ST.

NEW YORK: 1854.

THE HISTORY OF THE REIGN OF HENRY THE SECOND

BY JOHN GILBERT FROTHINGHAM

LONDON: PUBLISHED BY J. B. LIPPINCOTT, 15, N. 4TH ST.

NEW YORK: 1854.

THE HISTORY OF THE REIGN OF HENRY THE SECOND

BY JOHN GILBERT FROTHINGHAM

LONDON: PUBLISHED BY J. B. LIPPINCOTT, 15, N. 4TH ST.

NEW YORK: 1854.

ADVERTISEMENT.

HAVING strong grounds for believing that the mischievous employment of obstetrical instruments is a source of much misery, and of increasing frequency; and being persuaded that a more intimate knowledge of the efficacy and virtues of the spurred rye would tend very much to put an end to this evil practice; I have endeavoured to condense within a few pages, the observations contained in one of the best works which has appeared in France on this subject, I mean that of Dr. Villeneuve of Paris. In the hopes that the public will condescend to consider this, therefore, as an attempt to serve their best interests, and to diffuse knowledge on a point of no small importance to the safety of the female sex, and of their offspring, I now commit it to the press, and to their protection.

A. N.

58, Guildford Street, Russell Square,
15th April, 1828.

LIST OF WORKS CONSULTED AND QUOTED.

1. *Camerarius, Rodolphus Jacobus.* Acta Naturæ Curiosor. centur. vi. observ. 82, anno 1688.
2. *Parmentier.* Lettre à l'Abbé Rozier. Journ. de Phys. tom. iv. 4to. Paris, 1774.
3. *Tessier.* Traité des Maladies des Grains, 8vo. Paris, 1783.
4. *Valmont de Bomare.* Dict. d'Histoire Naturelle, art. Seigle; nouv. edit. 8vo. Lyons, 1800.
5. *Stearns, John.* Account of the Pulvis Parturiens, a Remedy for quickening Child-birth. New York Med. Repos. New York, 1808; London Med. Rep. vol. xix. London, 1823.
6. *Fool, Malachi.* Practical Observations on Ergot or Spurred Rye. Med. Repos. new series, vol. ii. New York, 1815.
7. *Prescott, Oliver.* Dissertation, &c. on Ergot. Med. and Phys. Journ. vol. xxxii. London, 1815.
8. *Renauldin.* Dict. des Sciences Médicales, art. Ergotisme; tom. xiii. 8vo. Paris, 1815.
9. *Chapman, N.* Discourses on Therapeutics, &c. Philadelphia, 1817; same work also, 3d edit. 1824.
10. *Bordot, Louis.* Considérations Médicales sur le Seigle ergoté, Paris, 1818.
11. *Desgranges.* Extrait d'un Mémoire, &c. Gazette de Santé, 1818—1819; also Journ. de Pharm. tom. x. 1824.
12. *Deweese, William.* Essay on difficult Parturition, &c. Philadelphia, 1818.
13. *Henrischen.* Sur le Seigle ergoté; traduct. de Journ. de Hufeland. Biblioth. Méd. tom. lxxii. 1818.
14. *Orjollet, P. A.* Dissertation Médicale sur les mauvais Effets de Seigle ergoté, Strasbourg, 1818.
15. *Percy and Laurent.* Dict. des Sciences Médicales, art. Infusion; tom. xxv. Paris, 1818.
16. *Wesener.* Le Journal de Hufeland, apud Bibl. Med. tom. lxii. 1818.

17. *Balmé*. Traité hist. sur le Scorbut, Lyons and Paris, 1819.

18. *Guiaud, fils*. Travaux de la Soc. Royale de Méd. Marseilles, 1819—1820.

19. *Villeneuve*. Observ. sur l'Emploi du Seigle ergoté. Bibl. Méd. tom. lxxii. ; Gaz. de Santé, Paris, 1819.

20. *Idem*. Mémoire Historique, &c. Paris, 1827.

21. *Bailly, A. A. P.* Sur l'Ergotisme, Paris, 1820.

22. *Bordot, L.* Instructions sur la Santé des Femmes encientes, &c. 12mo. Paris, 1820.

23. *Chatard, P.* Experimental Observations, &c. Med. Repos. new series, vol. v. New York, 1820.

24. *Legonais*. Dict. des Sciences Méd. art. Seigle ergoté ; tom. i. Paris, 1820.

25. *Bosc, B.* Nouveau Cours complet d'Agriculture, art. Ergot ; nouv. edit. tom. vi. 8vo. Paris, 1821.

26. *Desormeaux*. Dict. de Méd. art. Accouchement ; tom. i. 8vo. Paris, 1821.

27. *Giraud St. Rome, C. J. D.* De l'Inertie de Matrice, &c. Paris, 1821.

28. *Bigeschi, Giov.* Osservazioni, &c. 8vo. Florence, 1821. *Idem*, another work, 8vo. Florence, 1824.

29. *Gardieu and Marten*. Rapport, &c. Bulletin Gén. and Univers. tom. ii. Paris, 1823.

60. *Brinckle, W. D.* Case of Puerperal Convulsion successfully treated with the Ergot. Lond. Med. Repos. vol. xx. London, 1823.

31. *Cliet, M. H.* Observations Méd. Chir. Lyons, 1823.

32. *Eberle*. Materia Medica, 1823.

33. *Huchedé, P. E. F.* Considerations, &c. Thesis ; Strasbourg, 1823.

34. *Keyl*. De Secale Cornuto, &c. Berlin, 1823.

35. *Merriman*. On Difficult Parturition. Journal, Philadelphia, 1823.

36. *Raige Delorme*. Dict. de Médecine, art. Ergot ; tom. viii. Paris, 1823.

37. *Bidault le Villiers*. See American Med. Recorder, No. 20.

38. *Church, William*. Philadelphia Journal, May, 1824.

39. *Gardieu*. *Traité des Accouchemens*, 3d edit. Paris, 1824.
40. *Gerardini*. *London Med. and Phys. Journal*, vol. lii. 1824.
41. *Hosack, David*. Letter to Dr. Hamilton on Ergot, New York, 1824.
42. *Hufeland*. *Journal*, vol. lii. 1824.
43. *Lorinser, C. J.* *Versuche, &c.* Berlin, 1824.
44. *Davies, Henry*. On the *Secale Cornutum*. *Med. and Phys. Journ.* vol. liv. London, 1825.
45. *Lachapelle, Madame*. *Pratique des Accouchemens*, 3 vols. in 8vo. Paris, 1821—1825.
46. *Balardini, Louis*. *Uso della Segale Cornuto, &c.* Milano, 1826.
47. *Chevrue*. • *Observations, &c.* *Archives Gén. de Méd.* tom. xi. 1826.
48. *Evrat, Gardieu, and Baudeloque*. *Rapport*; as in the preceding article.
49. *Bourdettes*. *Lettre à M. Michel*. *Gazette de Santé*, 1826.
50. *Clark*. *Observations*. *Lond. Med. and Phys. Journ.* vol. lv. 1826.
51. *Dewees*. *System of Midwifery*, 8vo. Philadelphia, 1826.
52. *Duges, Ant.* *Man. Obstet.* Paris, 1826.
53. *Goupil*. *Hemorrhagie Uterine, &c.* *Nouv. Bibl. Méd.* tom. iii. 1826.
54. *Henry, Pelletier, and Planche*. *Gazette de Santé*, 1826.
55. *Léveillé, J. H.* *Mém. sur l'Ergot, &c.* 8vo. Paris, 1827.

To such persons as may be desirous of administering the spurred rye, it may be useful to know, that it may be obtained of the best quality, at MORSON'S, operative chemist, 19, Southampton Row; and at JAMES BUTLER'S, herbalist, Covent-garden Market.

ON SPURRED RYE.

CHAP. I.

THE vegetable substance called spurred rye, has been so denominated from its fancied resemblance to the spur of a cock. It is known throughout the different countries of Europe by various names, all derived either from its configuration or origin, or from the different qualities which it has been found to possess. Thus, in France, it has been called *ergot*, *argot*, *bled avorte*, *bled cornu*, *bled farouche*, or *have*, or *rachitique*, *calcar*, *chambucle*, *clavus fuliginis*, *clou de seigle*, *ebrun*, *faux seigle*, *mane*, *mère de seigle*, *secalis mater*, *seigle cornu* or *corrumpu*, *seigle à eperon* or *ergotise*, *seigle ivre*, and *seigle noir*; and Gaspard Bauhin has named it *secale luxurians*.

The name of mother-corn (*mutter-korn*), given it by the Germans, and which corresponds to a similar name bestowed on it in one of the provinces of France, is explained by authors in different manners. Some suppose that it is a name applied to it on account of its increased size, so much

larger than that of the healthy grains, but without any idea of its medicinal qualities : whilst others, and particularly M. Huchedé, think that this name has been given to it solely on account of its medicinal properties, and that it serves to prove its long continued adoption as a remedy in certain states of the muscular action of the womb.

CHAP. II.

NATURAL HISTORY.

As in the following pages it is intended only to treat of the medicinal qualities of the spurred rye, it will be quite unnecessary to enter into any discussion of the following questions, which are more particularly interesting to agriculturists and botanists, namely :

1. Whether it owes its formation to a superabundancy or depravation of the natural juices of the plant ?

2. Whether it is more particularly owing to the presence of a sort of honey-dew, which penetrates into and diseases the grain ?

3. Whether the seed-time has any influence upon its formation, as modified by the nature of the manure, or by hoar frosts, or from the soil being newly broken up ; or whether, as asserted by some writers, it is more common in plants near

the borders of the fields than those growing in the centre?

4. Whether rye when sown mingled with other grains, be more susceptible of becoming *spurred* than when sown alone?

5. Whether, as is believed by Duhamel, Ray, Tillel, &c. it be like the gall-nut, the result of the stings of certain insects, in order thereby either to feed themselves, or to deposit their eggs; a sting, by the way, which several authors have considered as being a sort of inoculation of an irritating fluid secreted by the insects, and productive of a degeneration of the grain. But, as M. Lèveillé remarks, this insect is not to be confounded with those aphides found creeping on the surface of the grain, and nourishing themselves on the viscid honey-dew with which it is covered!

6. Whether any of the microscopic generating eels of Fontana, observed also by Buffon and Needham, are to be found on it? or whether some other animalcules, such as those asserted by Rafu, and rejected by Roffendi and Rainville, produce it?

7. Whether this peculiar alteration of rye be not the result of putridity? an opinion entertained by Vauquelin and Virey, and some other naturalists.

8. Whether, as is asserted by Parmentier, the *spur* has its first origin from a state of weakness in the covering of the grain?

9. Whether or not it may be compared, as opined by Beguillet, de Jussieu, and Geoffroy, as a sort of false conception or *mole*, the result of some vice or defect of fecundation? or whether we should compare it to the schirri, elephantiasis, and other such morbid affections in the animal kingdom? or whether, according to M. Gadd, it be not like the goître, as being produced by great alternations of cold and moisture, the causes of goître in the human species?

10. Whether we should adopt the opinion of Paulet, of De Candolle, or of Todde, that the spurred rye is in fact a new vegetable engrafted in place of the grain; and, as they think, a sort of parasite fungus of the genus *sclerotium*, to which De Candolle has given the name of *sclerotium clavus*?

11, or lastly. Whether there are not different sorts of spurred rye, as believed by Wildenow, in his Pathology of Plants, and by him divided into two kinds, the one innocent, the other noxious; in which idea he is supported by Langius. The innocent being, according to Wildenow, of a pale violet colour, white within and farinaceous, devoid of smell and taste, and which may be ground without danger when mixed with other grain. While the second kind is of a deep violet or blackish colour externally, and in the interior of a greyish white, exhaling a disagreeable odour, and having a corrosive taste.

After this long list of opinions, as to the cause, formation, and nature of spurred rye, all announced by different authors, we shall quote that of Wesener, who disputes the whole, and yet does not establish any thing new.

To the above opinions we must lastly add the following observations, made by a young physician named L  veill  , and published last year at Paris in a short pamphlet. He states, that having observed attentively the spurred rye at different stages of its growth, he has discovered that this vegetable substance is composed of two portions altogether different. The one which is only the unimpregnated ovary, and which is the spurred rye universally known; the other scarcely observed, because it can only be perceived at a certain period of the growth of the *spur*, is susceptible of being detached with the greatest ease, or indeed of melting down under the appearance of a viscid juice, into which it distils itself. This latter portion is a true mushroom or fungus, to which he gives the name of *sphacelaria segetum*, on account of the property which he attributes to it of producing gangrene, when taken into the human stomach for any period of time. This fungus shows itself at the detached extremity of the spur, in the form of a yellowish substance of a conical shape, and varying in size, being often some fractions of an inch in length, unequal in surface, and covered over with very minute irre-

gular undulations. Its base, divided into four or five portions, embraces the whole of the external extremity of the spurred ovary. Its upper part is roundish or tuberculous, and sometimes presents a down, which, however, is foreign to its structure. This *sphacelaria*, when fully developed, gives issue to a thickish liquid, which is oleaginous, and drying up covers the surface of the spur, forming a slender crust of a dirty yellow hue, which splitting, finally detaches itself in the form of scales. By degrees the *sphacelaria* itself diminishes in bulk, becomes dry and wrinkled, and separates with the greatest facility from the spurred ovary.

But the growth of the *sphacelaria* is not always so regular in its progress. When the weather is rainy, at the time when this fungus has reached its full size, it is thoroughly washed, and then the juice which exudes from it being diluted, is carried off by the rain water, so that there remains no trace of its existence upon the spurred rye. Frequently the body of the *sphacelaria* itself is swept off, and at other times it is reduced to a very minute size.

Messrs. Baudeloque and Lèveillé, who however have not made any experiments themselves, are desirous that the *sphacelaria* or *sphacely*, should be administered alone in some cases, where the use of spurred rye is indicated, but only in the dose of four or five grains; whilst, in others, the spur itself should be given in the usual doses, and deprived as much as possible of the substance

before mentioned. From these comparative experiments, repeated for a sufficient number of times, results might no doubt be obtained which would enable us to judge, by means of facts, of the merely theoretical opinions conceived by former authors.

M. Lèveillé establishes also that the sphacelaria shows itself likewise on the spur which attacks several other vegetables which we shall enumerate hereafter. But waiving all these opinions, one truth is certain, that in some countries, and more particularly in Sologne, in France, during rainy seasons, it is observed that the crops of rye are much more subject to the alteration of which we have been speaking; whilst elsewhere it is only met with in solitary instances, and without any perceptible cause; and in some parts too, as in the environs of Paris, spurred rye is found in crops growing on a dry and sandy soil.

The grain of the rye, when attacked with the spur, first becomes softish and pulpy; soon bursting out of its husk, it attains solidity, and lengthening itself it assumes a reddish colour, which then changes to violet. Its increase, which is frequently very rapid, then shortly becomes such that the grain, so altered, is most commonly out of all proportion to the rest of the spike.

All the spikes springing from the same grain are far from being attacked with the spur; and a spike when attacked, generally presents but a few so

diseased. Sometimes, but more rarely, one portion only of the grain is thus attacked, and then it is always confined to the more external portion or extremity. It is stated positively, and in a way which removes all doubt on the subject, that spurred rye is incapable of germinating, and therefore that it cannot by possibility be reproduced by itself.

The spur ought not to be confounded with rust, the smut, or the rottenness, other diseases of corn, from which it is essentially different.

Wheat, barley, oats, maize, canary seed, several festucas, sword grass or carex, different loliums, and especially the *lolium temulentum** or ivraie, certain species of reeds, and millet seed, are likewise subject to the spur. Nay, Eymen asserts, that the family of palms are attacked with it, like rye, and that produces equally destructive effects, an assertion, however, which requires further confirmation. As to all these different instances of ergot, it is as yet quite unknown, whether they would produce any effects on the animal system corresponding to those produced by the spurred rye. The coloured print annexed to this pamphlet is intended to represent a spike of rye as attacked with this disease.

* The *lolium temulentum* is darnel, or the tares of the New Testament, which "the enemy" is said to have sown amongst the corn "by night." Matthew xiii. 25—29.

CHAP. III.

DESCRIPTION AND PHYSICAL PROPERTIES.

SPURRED RYE, in its mature state, is of a violet or brownish colour. Its size is very variable; some grains being less than healthy rye, and can scarcely be perceived in their husks, whilst others are from one inch to an inch and a half in length, and of a thickness in proportion. However the mean size of the grains of spurred rye is from six to ten-eighths of an inch in length, and two-eighths of an inch in diameter. Its form is nearly cylindrical, having its ends somewhat obtuse, at times a little pointed, and bent a little in the shape of a crescent. But there is a great variety in this respect; although in all the shape is more or less *monstrous*. They have generally a longitudinal depression or two running from end to end. Some grains have cracks, apparently from dryness; and in others small cavities, apparently the bites of coleopterous insects. On being broken transversely, they snap like dried almonds; and internally display a greyish white substance, closely covered by the coloured cortical part, which does not separate from it on ebullition. Seen through a microscope, this fracture presents in its centre an appearance of white brilliant grains like starch, and towards the circumference a violet shading

besprinkled with minute whitish spots. When reduced to a powder, it is of an ashen-grey colour, and of a very dry feel between the fingers. If quite fresh, spurred rye is of a disagreeable sickly odour; but if dry, and the grains in a good state of preservation, it is altogether inodorous. A certain quantity, after having been kept for some years in a close box, had contracted the disagreeable smell of rotten fish. It was also of a black colour, and almost all the grains were in a degree worm-eaten, with little of substance left except the cortical part, so that it was quite friable on touch. However, no other traces of insects could be discovered about them. In a state of powder, if carefully kept, the spurred rye, if it has any smell at all, has it so weak as to be scarcely distinguishable. When snuffed up into the nostrils, it produces a slight degree of irritation, like a small pinch of powdered tobacco, occasioning a tendency to sneeze, and a pretty abundant secretion of mucus. In the grain and quite dry, spurred rye has scarcely any taste, and on being chewed, leaves in the mouth a slight acrimony. But in the powder its taste is nauseous, bitter, and acrid, like that of corn when in a state of rottenness. On kneading up with warm water the flour of rye affected with the spur, a fetid disagreeable smell is very perceptible. The paste is not adherent, and the bread has neither the consistence nor smell of the common rye bread.

Parmentier, who had some made with flour containing one-third of spurred rye, asserts that the bread was quite inodorous, and only slightly bitter. However it may easily be conceived, that the qualities of such bread must vary according to the greater or less quantity of the spurred rye entering into its composition, which in a natural way can scarcely ever equal that formed by Parmentier.

CHAP. IV.

CHEMICAL ANALYSIS.

ALTHOUGH several chemists have made this substance the subject of experiments, yet the analysis of Vauquelin appears to be by far the most accurate; from which it results, that spurred rye contains—

1. A yellowish fawn-coloured matter, soluble in alcohol, exhaling a smell like that of fish oil.
2. A white oily matter of a bland taste.
3. A violet-coloured matter, insoluble in alcohol.
4. A free acid, which appears to be of the nature of phosphoric acid.
5. A vegeto-animal matter in considerable quantity, much disposed to putrefaction, and which on distillation furnishes a considerable quantity of thick ammoniacal oil.
6. A minute quantity of free ammonia, exhaling at the temperature of boiling water.

Lastly, it results from this analysis, that rye in its spurred state no longer contains any starch; that its gluten has become 'altered, and that it abounds with a thick ammoniacal oil, which is never to be met with in rye when in its sound state. The same chemist, wishing to clear up an important point in the natural history of spurred rye, has made a comparative analysis of *sclerotium*; by means of which he obtained results so totally different, that he considers the opinion to be quite erroneous, which would maintain that spurred rye is a species of *sclerotium*.

Pettehnhoffer, as cited by Ficinus, is said to have demonstrated in 1819 the existence of *morphine* in spurred rye. M. Combes too, who repeated the analysis in 1826, asserts that he found starch, but that he could by no means obtain in a separate state the active principle of this vegetable substance. M. Desgranges reports, that an apothecary of Lyons having analysed a part, the cortical part only of the spurred rye, had discovered therein a great quantity of resinous substance, soluble in alcohol and ether; which is perhaps only a modification of the oil contained in the internal part, which had become oxygenised by the contact of atmospheric air. There does not exist, at least as far as we know, any chemical analysis of the spur of the other grasses. It is the same with the *sphacelaria*, or *sphacelia*, discovered by Messrs. Léviellé and Baudeloque, the

analysis of which might throw great light upon the opinion they have advanced with respect to the different effects of spurred rye, such as what is daily administered. Whence also the necessity, in the opinion of M. Léviellé, of repeating the analysis of spurred rye, properly so called; not that he suspects any errors in the process of M. Vauquelin, but because having confounded in that analysis both the spurred rye and the sphacelaria, we know not to which of these two vegetable productions to refer such or such a principle furnished by that analysis. Still, however, the results obtained by M. Vauquelin have served as a foundation for many various opinions. Thus, M. Virey regards the copious animal matter discovered, as being the principle of that morbid alteration of the rye; while M. Corhaul says it is to the acid principle that we ought to attribute the origin of the disease in the grain.

Nevertheless, the results obtained up to the present time may furnish some useful hints for the medicinal preparations of this substance; in which further researches may probably yet discover an active principle, *sui generis*, as has been lately the case in regard to *cinchona*, *ippecacuana*, *nux vomica*, &c. &c.

CHAP. V.

MEDICAL HISTORY

WE need hardly trouble ourselves to inquire whether this accidental production of the vegetable kingdom is the same as that called by Pliny and Theophrastus *luxuries vegetum*; a question no doubt very curious, but quite foreign to the object of this inquiry. The medical history of the spurred rye, however, very naturally divides itself into two parts—one embracing its toxicology and pathology, and the other considering it only as an article of materia medica, and particularly connected with uterine affections and parturition.

HISTORY OF SPURRED RYE AS CONNECTED WITH
TOXICOLOGY AND PATHOLOGY.

The deleterious effects of spurred rye, when taken mixed with aliment, were first recognized, according to Mezarai the historian, by Sigebert de Gremlour, as early as the year 1096; whilst several other authors are agreed in attributing to Wendelin Thelius, a German physician who lived towards the conclusion of the sixteenth century, the first exact description of this substance, as well as the precise indication of its pernicious effects, which he published on the occasion of an epidemic caused by the use of this substance, and which ravaged the kingdom of Hesse in the year

1596. During the years 1648 and 1649, both Saxony and Sweden became a prey to a similar epidemic. Twenty years afterwards, the same accident took place from the same cause at Blois and Montargis in France. Nevertheless it was not until the year 1670 that the Academy of Sciences in Paris became first informed of the singular accidents which had happened in Cologne, in consequence of the use of bread there made from the spurred rye. In 1777 M. Tessier, having witnessed on the same spot a similar epidemic, made on this occasion various observations, researches, and experiments, the relation of which forms one of the most interesting portions of the memoirs of the Ancient Royal Society of Medicine, and which may be consulted with advantage by all those who wish to study the deleterious effects of spurred rye.

Since that period, several epidemics of the same nature have been observed in certain parts of France, but all more or less slight in degree. The last, which has been pointed out by M. Huchedé, took place in Burgundy in the year 1816. The manifest accidents resulting from the use of spurred rye, when taken freely during a longer or shorter time, and in proportions more or less considerable, are of two kinds; namely, first, giddiness of the head, spasms and convulsions, &c. &c. and secondly, gangrene and sloughing of the extremities.

These two kinds of accidents, which generally

display themselves separately, and under circumstances which it is not here our object to point out, constitute that morbid state called *ergotisme*, which is to be found very accurately described under that title by M. Renauldin in the *Dictionnaire des Sciences Médicales*.

One thing very remarkable, and which it is of importance for us to observe, is, (as we shall hereafter notice,) that amongst all the different accidents caused by the spurred rye, there is no mention made in a positive and formal way, of any instance of abortion or premature birth of any infant dead or alive. Of which fact we have convinced ourselves by repeated researches, not only in the relations of the epidemics already mentioned, but also in the generality of the works of those authors named in the list placed in front of this essay. We will particularly cite by name M. Renauldin, who has given an abridgment of the greater number of these epidemics, or pointed out the works where they are to be met with; accidents so severe, that they could not have escaped the researches of the author of the article *Ergotisme*.

It is also worthy of note, that M. Tessier is the only author who, to our knowledge, has mentioned abortions in consequence of the using bread containing the spurred rye; and even he has done so in a manner so very laconic, and with so few particulars, that it is most probable that this accident, so far from having taken place sooner or later with

all those pregnant women who had eaten this bread, and was so far from having been a frequent occurrence in the opinion of this author, that it appeared to him to be only in the common proportions, as happening usually to the female peasantry, a class exposed to poverty and hard labour, and therefore liable to various accidents.

We should make the same remark with regard to a like assertion lately reproduced by Baudeloque, evidently taken from Tessier. To which assertion, however, we might oppose that of Taube, who, describing the epidemic he had witnessed, says positively that the pregnant women attacked by *ergotisme*, were not subject to abortions; and that the lochial discharges of the parturient were in nowise deranged. From all which cases it appears certain, that the abortions which happened during the use of food made from rye tainted with the spur, did not occur at an early period after first using this food; and that they did not show themselves until the last severe accidents resulted, when the very principles of life were reduced to such extremities, that life itself could no longer be preserved: so that they ought not to be at all attributed to the special action of the spur upon the womb, and still less to its abortive quality, but rather to a complete destruction of the whole vitality, as we may daily witness in violent accidents from wounds, from severe acute and

febrile attacks, and in chronic affections more or less advanced.

Another very important fact is, that authors are equally silent as to derangements or suppressions of the monthly discharges in females during a state of *ergotisme*; which, to a certain point, might be considered either as an omission or a defect of observation, had not Burghardt stated positively, that “convulsive *ergotisme*” did not put a stop to the menstrual flux. A third fact to be considered, and of which there can be no doubt, as it has been frequently observed, is the preservation of the secretion of milk with wet-nurses, whilst they are using a diet composed of rye-bread contaminated with the spur: Tessier being here again the only person who has observed and stated the contrary. Renauldin has also remarked besides, that the “gangrenous *ergotisme*” does not attack females. But even before him, Tessier and others had acknowledged that spurred rye acted with less force upon females than on males; which may well be, since women eating in general much less than men, do not consume so large a quantity of bread containing this deleterious substance. In spite, however, of the plainest and most satisfactory evidence, that the prolonged use of this unhealthy bread is the immediate cause of the deaths which have occurred epidemically; yet several authors, such as Model,

Paulet, Ryan, Schleger, and Wolf, have been of opinion, that these deaths were rather caused by the great vicissitudes of the weather and temperature, than by the diseased state of the rye. We should not omit also to mention here Hufeland, as joining in the opinion of the last cited; and also thinking, that under some circumstances, the deaths ascribed to the use of spurred rye, ought rather to be imputed to the *ivraie* or *lolium temulentum*. But if necessary to refute such errors in judgment, it would be only requisite to call to mind the experiments made by Tessier upon various animals removed altogether from any of the noxious influence of weather and atmosphere, and which on being nourished with food containing more or less of spurred rye, have suffered in like manner as human beings.

Some other writers, such as Tissot, and Desgranges, maintain another opinion much more probable than the foregoing, namely; that on being dried and preserved, the spurred rye loses much of its noxious qualities. Still, as it is quite certain that even after being kiln-dried, and kept for several years, this substance still possesses particular properties, one must imagine that even then, if taken in great quantities, it cannot fail of proving deleterious.

HISTORY OF SPURRED RYE, AS AN ARTICLE OF MATERIA
MEDICA, AND ITS EXHIBITION IN PARTURITION AND
AFFECTIONS OF THE UTERUS.

IN like manner as many other medicines of great power and value, the knowledge of this substance has been hitherto almost confined to its poisonous qualities; and many physicians of great information have hitherto been quite ignorant that it could boast any other. Unable as we are to point out in what way the uterine and obstetrical qualities of this substance were first discovered, still we cannot agree with Davies and some other writers, that it was from having observed it employed with the culpable intention of producing abortion, that physicians have been led to convert its virtues to the benefit of suffering humanity: and this opinion we shall justify in the following pages.

Of spurred rye, first mentioned in 1596 for its noxious effects, no notice occurs as a uterine remedy till 1688, when R. J. Camerarius (a good name by the way) stated, that the women in certain parts of Germany were in the habit of employing this sort of grain to accelerate parturition. What also is very strange is, that from that period until 1774 no author had made mention of it as being so used; and it was only then that a very brief letter from Parmentier to the editor of the *Journal*

de Physique, made known that it was frequently used as a child-bed remedy by Madame Depille, a midwife at Chaumont, in the Vexin. But this letter, which is a mere announcement of the simple fact, contained no other information. It was therefore reserved for M. Desgranges, an able accoucheur at Lyons, to fully appreciate and make known the singular property of spurred rye. He having met with several midwives in 1777, both in Lyons and its environs, who, from a traditional knowledge, were accustomed to employ, with no little mystery, the spurred rye in cases of lingering labours, at length made himself a great many trials of it, which for the most part were crowned with success. Thereafter he published, at different times and in various journals, the results of his practice and observations, and specified, with the greatest care, the peculiar circumstances which admit or contraindicate the employment of this remedy. It is therefore to the zeal and knowledge of Desgranges that the public and profession are indebted for the precise acquaintance with this valuable remedy; which he never ceased propagating with all his talents, in spite of the strongest prejudices, and a variety of difficulties of all kinds which he had to surmount. When this discovery was first announced in France, the employment of ergotted rye was only known in the department of the Rhone, and some of the frontier departments. Soon after its

use began gradually to spread from various points throughout that kingdom, as may be proved from the great number of cases published since in periodical works, by practitioners in the different departments.

According to Dittmer, it is also used in different countries in Germany, and particularly in the environs of Ludwisbourg, in Wirtemberg, where this medicine is principally in the hands of the midwives, who, as he states, give it usually to be swallowed whole in the natural state, administering either five or nine grains for a dose, but always in odd numbers. At Florence also, as well as in other parts of Italy, at London, and more particularly in the United States of America, the spurred rye has been employed by enlightened men: and in America this substance appears to be already held in as much estimation as any well-established article of the *Materia Medica*.

Amongst the physicians who, in concert with M. Desgranges, have powerfully contributed to propagate the knowledge of this remedy, either by their writings or practice, we may mention Messieurs Bourdot, and Goupil, at Paris; Chevreul, at Angiers; Pistre, at Ferrara (who has also published directions to midwives how to employ this new medicine); Orjollet, and Huchedé, by their theses, defended it at Strasbourg; Bigeschi, at Florence; Clarke, Davies, and Merriman, in London; Dewees, and Chapman, in Philadelphia;

lastly, Hosack, Prescott, and Stearns, at New York ; from the last of whom we also learn, that spurred rye has long been administered by the rural matrons in Scotland.

We ought to add, that Hosack states, that he considers his substance as being useful in certain diseased affections of the womb, arising from weakness ; such for instance as uterine tympanitis, mucous discharges, &c. : and likewise Davies, who has employed it in favouring the expulsion of *polypi*, and other excrescences of a fungous nature, from the womb. His translator, M. Eusebé, has added, that if these excrescences be of a soft and pulpy consistence, the simple contractions of the uterus are quite sufficient to expel them ; and that when harder and firmer, their repulsion towards the vagina and external parts, must facilitate the employment of ligatures and other surgical proceedings, by which we may succeed in detaching them. Goupil advises also the same means in the uterine tympany from weakness of the muscular fibres of the womb ; and also in expelling collections of fluid, if arising from amenorrhea. Lastly, we should mention, that this substance has been prescribed as an antihysterical remedy by Lonicere, without his having acquainted us, however, with its effects in this disease.

CHAP. VI.

OF THE REQUISITE CONDITIONS FOR THE SUCCESSFUL
EMPLOYMENT, IN CASES OF PARTURITION, OF THE
SPURRED RYE.

THIS remedy can only be administered with success in cases of parturition under particular circumstances, which may be classed under the following provisoes :

1st. Provided always, that there exists no fault in the conformation of the bones of the pelvis, or of the soft parts of the mother, which can oppose any remarkable obstacle to the passage of the foetus.

If the dimensions of the pelvis be small, that is not sufficient *easily* to afford a passage to the expulsion of a full-grown foetus ; as for instance, less than three inches and a half between the pubes and sacrum ; the spurred rye, by exciting strong uterine contractions, without any possibility of overcoming the mechanical obstacle opposed by the straitness of the bones of the pelvis to the birth of the child, might be the cause of producing that very fatal occurrence—a rupture of the uterus itself. A similar inconvenience might result too, if the passage should be obstructed by any large tumour, or by any excessive straitness or great rigidity of the orifice or sides of the vulva.

The obliquity also, or any great deviation from a natural position of the womb, would form an obstacle, at least for a time, to the administration of this remedy.

2dly. Provided, that the neck of the womb be quite supple and yielding, and partly dilated; and that the time of parturition shall have decidedly commenced, or already existed for some hours.

Rigidity and hardness of the neck of the womb, from any cause whatever, as well as a diseased enlargement of this part, contraindicate in an essential degree the employment of this remedy; for the expulsive contractions of the muscular fibres of the uterus taking place from its fundus downwards, and towards its orifice, any great obstacle existing there to the muscular contractions, might be productive of a rupture, either in that spot or in some other parts of that organ.

In the case of a simple rigidity of the os tincæ and neck of the womb, provided it be not occasioned or kept up by plethora, we may employ a remedy of which M. Chaussier has made the most successful use in cases of parturition; and which, although in its effects quite different to those of the spurred rye, is found an admirable co-operative. We allude to the extract of belladonna, applied directly to the part presenting the rigidity; that is, to the neck of the womb itself. The for-

mula, as published by Madame Lachapelle is as follows :

R. Extract. belladonnæ, ʒij.

Cerat. simpl. ʒi. Misce.

In these cases also some persons have been very successful by administering gentle opiates, simply or combined with antispasmodics, which produce sleep, and resolve that spasmodic state which attends this affection.

It is particularly to Messrs. Chapman and Prescott that we owe the caution never to administer the spurred rye until a sufficient degree of dilatation shall have taken place in the os uteri: a dilatation which this remedy cannot immediately produce, and which Desgranges thinks ought to be at least equal to the size of a sixpence. Nevertheless some facts seem to prove, that this remedy may be prescribed with success even in cases where the process of parturition shall not have advanced so far as to cause so much dilatation: and this truth may be gathered from the following statement made by a French practitioner. "A female having suffered much during three former accouchements, and having reached the full term of her fourth pregnancy, took some of the spurred rye before her labour pains commenced: the orifice of the womb was not dilated, its edges being still hard and thick, and not at all moist. About half an hour thereafter she was safely delivered of a child." But M. Desgranges, to

whom this case occurred, and who is besides very backward in giving this remedy under such circumstances, thinks that its adoption could only succeed when the female subject is of a soft relaxed leucophlegmatic habit, and one who has already borne children, when the neck of the womb is in a yielding supple state ; and in short when, from all existing appearances, there may be reason to expect a labour attended with little pain, and very feeble contraction of the muscular fibres of the uterus. Our own opinion however is, that from all that has been advanced, it would not be prudent to prescribe this medicine unless labour seemed to be on the very eve of its commencement ; and we must by all means hesitate giving it in any case where the patient is only suffering from false or fugitive grinding pains, in the neighbourhood of the kidneys, loins, groins, &c. And in this state of uncertainty, and where there may be indications of a state of general exhaustion and weakness, as likely to retard the coming on of real labour pains, we ought, before having recourse to the use of the remedy, to try what may be done by giving the patient proper strengthening food, such as warm broths, and even a few glasses of generous wine. And while pursuing this plan, the practitioner ought to take the opportunity of satisfying his mind that the position of the child is quite natural. On the same grounds, we ought not to administer this remedy in cases of pre-

mature accouchement ; where the waters continue to drain away several days before parturition has really commenced ; where there is neither any dilatation of the os uteri, nor any real pains. In a word, here, as in all other instances, *art should never precede nature* in hastening the natural act of delivery.

There is only, perhaps, one case of exception from this general rule ; and that is, where the foetus, whatever may be the stage of pregnancy, has been dead for some time ; and that this death is notoriously indicated by all the usual characteristic symptoms. In such an instance, if the womb makes no effort to get rid of the dead body which it contains, and which is enfeebling or diminishing its vitality, it is admissible to attempt, by this means, to bring on its requisite muscular contractions, the result of which cannot possibly be attended with any disadvantage to the mother. |

3dly. Provided also, that the foetus is presenting in such a manner as to be expelled naturally ; or without any necessity for the interference of art to change its position, and that its bulk is not too great for the natural passages.

Every person at all acquainted with the nature of parturition, will easily conceive the importance of this last general rule, which needs not the support of any reasoning.

The following fact, however, as stated by Henschen, proves that this important rule has been

overlooked. "Being called into a woman whose waters had flowed away twenty-four hours previously, this practitioner found her almost in a dying state, and yet having very strong and frequent labour pains. He found that she had been taking, by the advice of the midwife, a quantity of spurred rye; that the genitals were greatly swelled, burning hot, and of a dark livid colour, approaching almost to black. The great and small labia were protruded greatly; and there was a falling down of the rectum to the extent of three inches." M. Henrischen discovered, "that the improper position of the head of the foetus was the real obstacle to its delivery, and applied the blades of the forceps with success, whereby he succeeded in saving the life of the mother."

Here too we ought to remark, that wherever parturition is considerably advanced, or the os uteri is sufficiently dilatable, and the lower extremities of the child are presenting, it would be always more advisable to pull down the feet, and deliver the woman, than to try to excite the action of the womb by means of the spurred rye. And indeed in all the numerous cases to be hereafter quoted, we find no instance of a foot presentation treated by administering this remedy; so that we may conclude, that practitioners are pretty well agreed on this point. Also in those cases where the foetus is monstrous, either from enormous bulk or malconformation, we should be adverse to the

giving this remedy. However, even in these, if the practitioner can succeed in diminishing to a proper size, by means of the operation of embriulcia, the excessive bulk of the child's head, there can be no objection, according to the opinion of Dr. Davies, in prescribing the spurred rye to assist in finishing the act of parturition, all other circumstances being favourable. Lastly, it is necessary to abstain altogether from the giving the ergot, if it be discovered that the umbilical cord be twisted several times round the neck of the foetus, and is thus causing an obstacle to delivery. So that it results from all which has been said in this chapter, that for the methodical and salutary employment of this remedy in cases of child-bed, the principal indication required, is the absence of sufficient uterine contractions to expel the contained foetus.

CHAP. VII.

CIRCUMSTANCES IN WHICH THE SPURRED RYE OUGHT NOT TO BE GIVEN AT ALL, OR AT LEAST WITH MUCH CAUTION AND RESERVE.

THE cases wherein this remedy is either contraindicated, or would prove hurtful, are now to be mentioned. And here we may first observe, that spurred rye, like all other remedies, ought never

to be employed during parturition, as long as the powers of nature herself can suffice to finish the act of child-birth. The most frequent obstacle which presents itself is a state of plethora, or turgidity of the blood-vessels; as characterised by discolouration of the countenance, head-ache, fullness and hardness of the pulse, accompanied by strong uterine pains, without any expulsive efficacy; the orifice of the uterus being more or less thick, and in a state of hardness and rigidity, and pretty nearly closed. In this state of things, where blood-letting and the other means of depletion are indicated, the ergot of rye, so far from proving useful, might be very prejudicial, by increasing the rigidity of the os uteri and muscular fibres, more especially if its use should be persevered in, and the subsequent doses augmented on finding the first ineffectual. The following case, as stated by Henrischen, demonstrates the dangers of such a practice under the circumstances just pointed out: "A young woman, to whom a midwife had given some grains of spurred rye, in order to bring back the labour pains, which had ceased, had a speedy return of pain, much more intense in degree than any which had preceded: when, almost in a state of phrenzy, she clenched her hands, and then seizing upon the midwife by the head, in a convulsed state she soon brought into the world a living child." It is therefore a good rule laid down by Prescott, and which ought never to be

forgotten, "*that the ergot of rye ought never to be given during child-birth where the use of blood-letting is indicated.* But if *after bleeding*, either from its having been too copious or otherwise, the uterus shall have fallen into a state of torpidity, it is evident, in the opinion of Chalard, that recourse may be had to this remedy, provided there exists no other difficulty. Chapman and Prescott seem also agreed in recommending the prescription of the ergot after bloodletting, as being a good method of removing a general and local detention. It is true that Prescott is wont to abstract as much as thirty ounces of blood, which, if it be his general practice, we ought to recollect that although such a quantity may be found suited to the females on the other side of the Atlantic, here in Europe we might find it excessive; and that it would be thoughtless first to exhaust the strength, and then to have recourse to auxiliary means, which might have been unnecessary had the bleeding been more moderate.

The actual presence, or even the threatening, of spasm and convulsion, either of the whole frame, or of the womb alone, form also a contra-indication to the employment of spurred rye. We should therefore hesitate in recommending the practice advised by Chapman and Stearns, of administering this uterine stimulant, in order to hasten delivery in the case of child-bed convulsions. The singular theory propounded by the latter is

this: That during parturition the contractions may be transferred from the uterus to other parts of the body; wherefore he adds, that after a copious general bloodletting (the action of the remedy being to accumulate the vital forces upon the uterus) the proper expulsive contractions take place, and the consequent expulsion of the foetus and entire cessation of the state of convulsion. Stearns supports this theory by a very curious fact, borrowed from Waterhouse, the principal circumstances of which are these: "A woman of nervous temperament, aged nineteen, having been attacked by the usual precursory symptoms of child-birth, was found by Mr. Waterhouse suffering very great pains in the back and abdomen, and with a shooting pain in the head, with a naturally slow but tense pulse. A venæsection of sixteen ounces, with fomentations to the abdomen, and a little opiate, gradually gave relief; and in the evening the woman slept calmly. After a quiet night some symptoms of delirium showed themselves; the patient complained of tormenting pains in the abdomen, and darting pains in the head. These symptoms increasing, were followed by one of the most frightful attacks of puerperal convulsions ever witnessed. She uttered the most incoherent expressions; her eyes rolled in their orbits; and biting her tongue severely, streams of blood flowed from the mouth; while the extremities were of a deadly coldness. The most

violent spasmodic contractions of the muscles of the back, abdomen, the neck, and lower jaw, convulsed her whole frame. On examination, the os uteri was found sufficiently dilated: but all the means commonly pointed out proved unavailing. Meantime the strength was sinking; the pulse becoming small and frequent; the respiration laborious; and the appearance of the countenance quite ghastly. Whilst in this state, Mr. Waterhouse thought of administering the spurred rye as the only probable remedy to save her life. He mixed up thirty grains of this substance powdered, in a small quantity of warm water, and gradually gave it to her by tea-spoonfuls, introduced between her teeth, her jaws being nearly locked. The effects of this remedy were almost instantaneous, and truly wonderful: the pains and spasm disappeared; her ideas became sane and regular; the patient awakening as if from a state of deep sleep, and complaining much of debility; a cup of tea with some light nourishment was then given to her, and she fell into a peaceful slumber. In the evening, lively and rapid labour pains came on, and she was delivered by Mr. Waterhouse in a short time, with perfect safety."

This case, although in itself sufficiently curious, is, in our opinion, scarcely adequate to combat our assertion: first, because in medicine no single fact can establish or destroy any general rule; and next, because the rapidity with which the con-

vulsions ceased after giving the medicine, make it doubtful whether this could have been the effect of the remedy. And we may also remark, that the delivery in this seemed only a secondary effect of the ergot of rye, the expulsion of the child not having taken place till some considerable time after the employment of the rye, of which the immediate effect was the cessation of the convulsive state which hindered a spontaneous delivery.

Another American physician, Dr. Brinkle, reports an analogous case. A woman in travail was attacked with convulsions, and from the morning when they came on, bloodletting, blisters, and synapisms had been employed without effect. The spurred rye having been administered, the child was born at the end of an hour and a half, and all the convulsions ceased. In spite, however, of the successful issue of this case, Dr. Brinkle expresses some doubts as to the efficacy of this remedy in cases of puerperal convulsions.—The opinion of Dr. Davies on this subject, as related by M. Huchedé, may be here stated. “Speaking of ergot of rye, Dr. Davies acknowledged to him the advantage to be derived from it: 1st, In discovering the spasm of which the uterus was the seat: 2dly, in awakening the proper contractions of the uterus when they are becoming languid, or have totally ceased; particularly when the torpidity of this organ seems to arise from the rigidity of its mus-

cular fibres." Still, however, if more trials should be made of the ergot in such cases, we should advise great circumspection in its use, and that the practitioner should be on the watch, so as to adopt any measures in the event of any failure in a case of so great exigency.

Another circumstance also, which up to a certain point is opposed to the giving this remedy, is, any extreme degree of nervous susceptibility, either habitual or occasional, in the woman in travail; as it has been remarked that in such circumstances this remedy is very exhausting, and oftentimes fails; which likewise happens more or less in cases of considerable general debility. We must also avoid giving it, if possible, to females whose stomach is feeble and irritable, consequently liable to vomiting: and for the same reason we ought not to give it to those who have suffered greatly from vomiting during the course of their pregnancy. Neither ought we to administer this remedy but with great reserve to females possessing an excessive uterine sensibility, and subject to great irritation therein; to whom any irritating diet, or external excitations, are apt to prove hurtful. Lastly, it will be prudent not to give the ergot to females, who in their former lyings-in have been attacked with *metritis* or *peritonitis*, for fear of any return or relapse of these attacks: although, if we may trust to M. Billard's report, he has seen this remedy

given without the least inconvenience or bad consequences to women in labour, even when peritonitis was a prevalent complaint amongst females in child-bed.

CHAP. VIII.

PREPARATIONS, DOSES, AND METHODS OF PRESCRIBING.

THE different preparations or forms under which the ergot of rye may be given, are as follows :

1st, The powder ; 2d, the infusion ; 3d, decoction ; 4th, watery extract ; 5th, spirituous tincture ; 6th, ætherial tincture ; 7th, spirituous extract ; 8th, the syrup.

Powder.—This is the most simple of the preparations of this substance, and which may indeed serve for almost all the rest. Its properties are more apparent in proportion to the fineness and freshness of the powder. This preparation, hitherto acknowledged to be the most active and efficient, is also that which is the most frequently administered ; wherefore it has been called by Stearns, *pulvis partu riens* : also *pulvis partum accelerans*, and *poudre obstetricale*, by Desgranges ; and *poudre ocyotique* by Bordot. The dose must be varied according to the particular circumstances of the case ; and be suited to the

susceptibility of the patient in regard to the remedy. The quantity may be greater or less in proportion to the age, nervous habit, debility, or strength, &c. of the female in child-bed. It must be proportioned also to the particular sensibility of the stomach and uterus; according to the courage or timidity of the female; the duration of the labour; and the interval which may have elapsed since the rupture of the membranes. Regard also must be had to the size of the child, &c. Lastly, it is a maxim laid down by the best authors, that the spurred rye ought to be given with more reserve to women bearing their *first* children than to others. The dose then should be from ten grains (which is the largest prescribed by Stearns) to ninety grains, and even more, during one parturition; and it may be given in a small wine-glassful of any fluid most agreeable to the patient, such as barley water, capillaire and water, cinnamon or orange water, &c.; and it may even be given in jelly or marmalade; but as the powder is not of a disagreeable flavour, it is needless to give it in pills or boluses, as its immediate action might be delayed thereby, and valuable time lost.

As we must for the most part be ignorant to what extent exactly this substance may act upon the person to whom we are giving it; and as there might arise much inconvenience in hurrying a labour too much, we ought never to exceed twenty grains for the first dose; and even this we

had better give in two portions taken after a short interval. But if at the end of a certain time, an hour for instance, there should result no apparent effect in the action of the uterus, we may give an equal quantity, that is, another scruple for a single dose: and should it become necessary to administer a third dose, we may then give thirty grains. In an extreme case, where at the end of a certain time even this third dose should have produced no effect, we might possibly venture on giving a fourth of the same weight; after which it would be a point of prudence to abstain; whatever may be the tardiness of the labour, or the degree of torpidity of the womb. It may be easily imagined, that the manner of giving the spurred rye may vary infinitely; and that what we have advanced on this subject is far from constituting an invariable rule; as the ergot may be prescribed in different ways, according to the circumstances of the female patient, and also according to the particular views of the practitioner.

We ought however to observe, that when given in too feeble doses the ergot of rye only produces very weak muscular contractions of the womb, which are so far from making that organ expel its contents, that they serve only to fatigue and wear out the strength of the patient. Although we have recommended this remedy to be generally given in some innocent weak fluid, without the addition of any substance capable of seconding or modi-

fying its effects; and although this is most advisable when we wish to ascertain precisely its effects; yet some authors have recommended, so as to augment its activity or facilitate its administration, to give it in wine, and more particularly in *good generous* wine. Thus Balardini advises giving it in white wine, having remarked, that in this vehicle the stomach never rejects it. Others have recommended the addition of a certain dose of musk, or of cloves, or of the distilled waters of nutmeg, mint, &c. Bordot, without pointing out the dose, joins the nutmeg in substance with a certain quantity of powdered sugar; while Goupil gives great praise to the following formula:

R. Secalis nigri, in pulv.	ʒi.	
Syrupi simplicis	ʒi ss.	
Ol. menthæ essent.	gtts. iij.	Misce in mortario.

To be given in doses of a spoonful at intervals of ten minutes.

We may add, that in the generality of cases where it is judged expedient to make any addition to the ergot of rye, the taste of the patient may be consulted. Stearns and Gill recommend also to give opium in addition to the spurred rye, in the proportion of one grain of opium to thirty grains of the ergot: and Stearns asserts, that if this mixture be given by dessert or table-spoonfuls every ten minutes, you may often succeed in bringing back labour pains when they have been suspended. But as he does not specify the exact

nature of those cases wherein it has been given, we are left to imagine that delivery has been impeded by a spasmodic contraction of the os uteri, and in those cases it would perhaps be preferable to use the local application of the extract of belladonna, and give the ergot internally without the opium. It is observed by M. Villeneuve, that in many cases it may be proper to give the ergot without apprising the patient or her friends and attendants of the nature of the medicine prescribed. But of course this must depend on the discretion and influence of the practitioner.

The infusion; the tea of black rye of the American midwives.—One drachm of the powder is to be mixed with a wine-glassful of boiling water, and left till almost cold. It is then to be strained, and divided into two equal portions, and administered, leaving an hour's interval between the first and second dose: of course it will be useless to give the second quantity, if the first should answer. To this preparation Messrs. Chevrueil and Akerly give the preference; and Walter thinks, that we may double its strength by making it from two drachms instead of one of the powder.

Decoction.—This is the *decoctum parturiens* of some writers: it is made in the same proportions as the infusion; but the mixture is made to boil for a quarter of an hour; and it is given in the same way as the infusion.

M. Baudeloque states, that after boiling it for ten minutes, the spurred rye only loses twelve grains out of sixty. Madame Lachapelle gave the ergot in decoction and infusion, using it in doses of two drachms, boiled in water, and leaving the powder in the liquid without filtering it; and which doses, she asserts, *produced no effect* one way or other. Foot boiled up the entire grain, even in ounces at a time, and gave the decoction by table-spoonfuls at short intervals. Desgranges recommends roasting the powder gently before the fire; and also states, that he gave the black external cortical part only, in doses of four or six grains, without any of the inner substance, and that these small doses proved equal in effect to half a drachm of the entire grains. As to all the other preparations before alluded to, since we know nothing of any particular effects or advantages they may possess, we shall barely confine ourselves to their simple enumeration. Desgranges states that they have all been used at Lyons; and Bordot states, that Godeville prefers the special use of the extract.

M. Villeneuve mentions, that the spurred rye may be administered advantageously in *lavements*; and that it is the best mode of using it whenever there is too great a susceptibility of the stomach, or nausea, vomiting, and repugnance on the part of the patient to swallow it. From the close sympathy between the rectum and uterus, we may

augur well of this method of using it: of course, in this manner we may give it in much larger quantities than when swallowed. Two or three drachms of the powder may be boiled in half a pint of water, and strained off for use; and if the first *enema* fails, a second or third may be given.

CHAP. IX.

EFFECTS OF THE SPURRED RYE UPON THE UTERUS, &c.

THE general effects produced by the spurred rye given during the act of parturition, and displayed very soon after its being received into the stomach, that is, at the end generally of ten or fifteen minutes, according to the individual temperament of the female, are nearly these:* Strong contractions of the womb; or, if you will, the uterine pains, just before languid, feeble, and at long intervals, or scarcely felt, show themselves in the most pronounced and decided manner. Generally the first pains which are felt from the influence of this

* Of twenty cases wherein Prescott took notes of the length of time which the black rye took to operate, these are the results. Two where the medicine acted at the end of seven minutes; one at the end of eight; seven at the end of ten; three at the end of eleven; three at fifteen; and four at the end of twenty minutes.

remedy are moderate, but soon display a very different character from those which preceded. If there had existed any pains in the small of the back, these vanish, and are replaced by true uterine pains, which very shortly become expulsive. At the same time if there are uterine pains not well pronounced, but still not expulsive, this remedy soon makes them assume their requisite quality. In all these instances, in proportion to the sensibility or individual susceptibility, these pains acquire very soon such a degree of force, that the patient, who may have hitherto made scarcely any sighs, soon indicates very audibly by her voice, her sufferings, as well as the great violence of her uterine pains. At the same time her figure becomes animated, the eyes sparkling, the pulse accelerated with an increase of force, &c.; circumstances which contradict the assertions of Dr. Davies, stating that the circulation is not at all affected, whatever may be the violence of the uterine pains. Besides these particular symptoms, which are perhaps always more or less attendant on all cases of quick delivery, Foot and some other writers have remarked in the character of certain females, upon taking the spurred rye, an increase of irritability, agitation, impatience, and violence of temper, easily augmented by the very slightest causes. These last symptoms are the result of a degree of cerebral excitement, caused by the severity of the pains, and coming on in the

course of many accouchements, even where no spurred rye had been given, and which therefore ought not to be attributed to this remedy, as it really does not appear to exert any action upon the brain itself. If during the pains the hand be laid on the lower part of the abdomen, the uterus will be found contracted firmly, and presenting a circumscribed globular figure beneath the abdominal parietes, which are vigorously assisting its efforts. Indeed such is the vigour of these uterine contractions that the fœtus cannot reascend, and remains unmoveable during the intervals of pains, so that every fresh contraction causes it to descend still lower. Nay, in some females so powerful is this action, that while attending the wife of a physician, M. Chevrue! perceived, that during the intervals between each pain, the uterus never ceased acting upon its contents until the child was completely expelled.

On examination it is found, according to the stage of the labour, that the orifice of the uterus becomes more or less dilated, and is making way for the presenting portion of the child, or the bag of waters, provided the membranes are still unbroken. In a word, every thing announces the return or existence of labour pains, and a speedy delivery; which takes place very frequently within half an hour after the employment of the remedy, particularly if it is not *a first child-birth*.

The child being born, the womb continues to

contract, closing upon itself, either by means of its natural contractibility, or from the effect of the remedy. The woman then suffers no other pains than those which have produced delivery; which being completed by the expulsion of the placenta, &c. she remains then, all other things being equal, as if no remedy had been employed. M. Chevrueil observes, that the blood furnished by the umbilical cord presents no character different at all from other cases. In regard to delivery we ought here to state, that we know of no case where the ergot has been employed a second time to procure the expulsion of the placenta, after having been already given to hasten the birth of the child. Without, therefore, prejudging this question too much, we are induced to conclude, that the uterine contractions produced by the ergot (in the case of torpidity of the womb during parturition) continue sufficiently long in all cases to bring about the expulsion of the placenta, as well as to hinder all subsequent hemorrhages. For there is no instance of any accident from this cause having happened after the employment of this remedy; more particularly as we know, that it has often been given to females who, after delivery, had suffered before more or less severely from hemorrhages: and these remarks seem to confirm the opinion of Foot, that even after delivery, the uterine contractions produced by the ergot continue for at least twelve or fifteen minutes.

With regard to all the subsequent effects of parturition, such as the flow of the lochia, the secretion of milk, and other changes, all these go on in their exact natural order as usual. Nevertheless some authors, and especially Prescott, have observed, that when the black rye had been used to assist delivery, the lochial discharge was still less abundant than in other cases. He even mentions, that in two females this discharge ceased completely on the second or third day after delivery, without any bad consequence having resulted therefrom.

In one of M. Goupil's cases it is stated also, that the lochial flux was very scanty; but it is important here to remark, that this remedy had been then given to stop a considerable flooding, and that in all the cases of flooding after child-birth, the subsequent discharges are always more or less diminished. Villeneuve states, that in all the cases where he had given the black rye (which, by the way, were all cases of child-bearing) the lochial flux had never presented any uncommon appearance, neither as to its quantity, nature, or duration.

M. Goupil also makes mention of two women, who upon taking this remedy were seized with violent colic. But as it was the third child with one, and the fourth with the other, and as consequently both were so circumstanced that colic is then a frequent occurrence, no inference can

thence be drawn against the use of this medicine. In the last case reported by the same author, he mentions also, that a sort of tenesmus supervened, with a violent pain in the kidneys, and strong bearing down pains ; and which state lasted some part of the day of her delivery. But is all this train of symptoms really to be attributed (as that writer supposes) to a too prolonged action of the ergot of rye ? or rather, may not the dose given have been stronger than was requisite in this particular instance.

In some cases the hope of a speedy delivery is not realised ; and at the end of a certain time, an hour or two for instance, the uterine contractions, provoked by the spurred rye, become tardy, rare, and languid, and even cease completely. It is necessary then, provided no cause exists to the contrary, to have recourse, as we have already stated, to one or several more doses of this medicine, from which we then generally obtain the desired effect.

Still there are cases where the ergot of rye, after having produced the most decided uterine contractions, finishes by being of no avail against the obstacles which the head, after having escaped through the cervix uteri, has still to surmount from the narrowness of the pelvis, or from the rigidity of the vagina, in women bearing their first children. It is then that, according to the example of Chevrueil, and at the end of a certain time, spent

in unavailing efforts, the delivery ought to be finished by means of the forceps. This practice, or rather necessity, does not by any means detract from the good effects of the remedy; which in cases like this is still a means of shortening the duration of the labour, by determining the complete dilatation of the os uteri, and thus proving favourable to the employing of instruments. As to the cases of complete want of success, we shall treat of these hereafter. It happens with some women, from one of the causes already pointed out, or from different circumstances, that a greater or less quantity of the medicine is rejected by vomiting a few moments after it has been swallowed; most frequently the second dose shares the same fate. In this case we should administer the remedy in a *lavement*. What is remarkable is, that with some women, in spite of the complete rejection of this remedy from the stomach, there has resulted, notwithstanding, a marked action towards the uterus, either from some small portion having been left in the stomach, or from the energy imparted to the whole frame from the vomitings, and from the sympathy that exists between the stomach and the uterus.

Another remarkable phenomenon which has been observed, at least in one instance after taking the ergot of rye (which, however, had been given in a dose of not less than a drachm and a half), is that of a state of intoxication, which

lasted an hour. Yet M. Goupil, who makes mention of this occurrence in his fifteenth case, thinks it could not have been caused by this medicine only. Dr. Villeneuve observes, that as in other instances of the healing art, where the well informed and judicious physician is forced to agree that nature, in some cases, would have sufficed as well without as with his assistance; so it may happen with regard to the use of the ergot of rye; for the ergot may be administered after being perfectly indicated, and yet the delivery may take place equally well without any sort of assistance: for we see daily the labour pains totally suspended, and then after an interval resuming spontaneously their course, and the labour concluded so promptly, that the practitioner is sometimes quite at fault.

This sort of declaration, Dr. Villeneuve adds, he feels himself induced to make in the name of the partizans of the spurred rye, by way of serving for an answer to certain arguments of their adversaries, who pronounce them to be as much prejudiced *in favour* of this remedy, as they themselves are *against* it: insomuch, that on one side they do not believe them capable of acknowledging, that in some cases the natural efforts might have proved sufficient without any other means; whilst the others pretend, that all the successes of the ergot are only apparent; the contractions of the uterus relaxed, enfeebled, or suspended, after

a shorter or longer interval, being always, in their opinion, upon the very eve of being reanimated, or appearing again, just when the use of the spurred rye has been resolved on. Notwithstanding it has been clearly proved, that in the majority of instances where the labour pains have returned followed by delivery, immediately after the methodical employment of the spurred rye, that these effects are as completely the effects of the remedy, as that the nausea and vomitings which supervene after the administration of an emetic are due to that medicine.

We shall conclude this chapter by remarking, that whenever the pains do not become vigorous after more than half an hour subsequent to the giving the ergot, there is every reason to believe that it has nothing to do with the return of the labour; and still more so, that whenever the delivery does not ensue till several hours after taking the remedy, that it has been accomplished entirely without its assistance.

CHAP. X.

MODE IN WHICH THE SPURRED RYE ACTS.

WE are as yet completely in the dark as to the exact manner in which this remedy acts during parturition. All that we know for certain is, that this singular effect arises from its awakening and

determining the muscular contractions of the uterus, when they become enfeebled or suspended during the course of child-birth. It is also quite evident, that the spurred rye only acts upon the womb through the influence of sympathy, the uterine pains coming on shortly after the swallowing the remedy; which, in spite of a contrary opinion expressed by Hall and Guiaud, would seem to forbid all idea of absorption through the ramifications of the circulation; and that its action is quite immediate, so to speak, upon the uterine organs. This remark is particularly founded upon what takes place when the spurred rye is administered by the mouth, for then it is quite evident that it acts by bringing into play, in a manner peculiar to itself, the sympathies which the stomach exercises upon the uterus, and from whence results the necessary expulsive contractions, by aid of which that organ gets rid of the fruit of conception. We may also conclude, that when taken by the mouth it exerts no irritative action upon the intestinal tube, and produces no sort of alvine evacuation; and, according to M. Billing, after having passed *through* the stomach, it has no longer any action on the uterus, as there is no sympathy between the womb and the *small* intestines.

As to the *modus agendi* of the ergot of rye, when it is administered in *lavemens*, we may equally conclude that its action is quite sym-

pathetic, the rectum and the uterus having sympathetic connexions of various kinds, as has been perfectly proved and demonstrated by a number of facts, anatomical, physiological, and pathological.

The mode of action of the ergot of rye, when we inject into the veins a liquid more or less impregnated with it (as M. Girard did to accelerate parturition in a cow), is explained by that elective sensibility in animal bodies, which causes a medicine (whose action is more or less special upon any particular organ), when injected into the veins, or introduced into the system by any mode more or less remote; to act, nevertheless, at the end of a given time, upon that same organ just as if it had been applied to it in the first instance. This happens, for example, whenever we inject an emetic solution into the veins, which injection very soon acts on the stomach, and produces vomiting. When the ergot of rye is directed at once upon the os uteri, or even inside of that organ by injections, its immediate action would be inexplicable in any other way than by saying, that it operated by immediately bringing into play the contractility of the organ itself.

Foot, Waller, and Mackenzie, all join in acknowledging, that this remedy can only act during parturition, by sympathy conveyed by aid of the nerves upon the muscular system, which thus proves the active agent of delivery; supposing that the diaphragm and abdominal muscles enter at

that time into a state of convulsion. One of them, Waller, supports this opinion by the analogy which he thinks exists between the effects of the ergot given methodically, and the convulsive ergotisme, which he compares to the phenomena resulting from the action of *nux vomica* upon the animal system. But, as we shall show hereafter, there does not exist any degree of convulsion in the effects produced by spurred rye given methodically: so that in our way of thinking, one part of this theory must be regarded as erroneous.

Stearns, who also admits the sympathetic action of this remedy from the stomach towards the uterus, supposes that it produces upon the latter organ a debilitating effect, just as emetics do upon the system at large; and that it acts, in short, as bloodletting does, by producing a state of relaxation; which, however, is in our minds a supposition entirely at variance with the real facts.

A very ingenious comparison started by M. Baudeloque, is perhaps much more agreeable to truth; namely, that the effect of the ergot upon the muscular fibres of the womb, is very analogous to the powers of a minute quantity of spirituous liquor introduced into the stomach during a journey, when the muscles are fatigued, which, by reanimating their fibres, enables us to continue our exertions, and fulfil the remainder of our task without causing any convulsion. From what has been said, and also from the known nature of the

spurred rye; its chemical analysis; its immediate effects upon the stomach (where it produces no more feeling of heat than upon the rest of the frame); and lastly, from the promptitude of its action; we may conclude, that this substance does not act in exciting the uterine contractions, like cordials and corroborants, which only operate by a general stimulating of the whole animal system, and which excitation the womb feels only in common with the rest of the system, but which is generally prolonged even after the expulsion of the products of conception. It may be added, that when injected into the rectum, neither does it act like other irritating substances administered in this way (as we have already stated), in order to awaken or quicken the uterine contractions, as is well proved by the experiments of Desgranges; who gave to several females *lavemens* containing the spurred rye without their knowledge, and which produced neither irritation nor evacuation. Having stated so much, there remains nothing very probable to be advanced; and we may well agree with Stearns, in asserting, that it is impossible to explain how the ergot succeeds, or, particularly, how it happens to fail: for, as Bigeschi says, in order to explain the singular action of this remedy, we should have to build up a heap of conjectures, of which there would probably be no end.

A very remarkable fact, particularly pointed out

by Waller and Bailly, is, that this substance does not appear to have any very decided action upon the uterus, except when this organ, containing the product of conception, is just about to expel it; that is to say, either when the pregnant female is just about to miscarry, or to bring forth. We have already stated, that amongst the accidents caused by the use of bread containing the ergot of rye, no mention is ever made either of abortion or premature parturition, as being its immediate effect. Chapman reports only, that when given to pregnant women, the ergotted rye occasions a certain uneasiness towards the uterus. Lastly, we are in possession of one case, from which it results, that twenty grains of ergot in powder were given at an improper time, but without causing any bad effect to a woman who had false pains, and who was not delivered until one month thereafter. Another American physician, Dr. Hall, full of prejudiced opinions against the ergot, would make us believe, that this substance acts in the manner of a poison; causing great disturbance in the system; rendering the pulse small and feeble; acting in a poisonous manner upon the blood; and imparting to this fluid qualities equally hurtful to the mother and child: finally, neither determining nor hastening delivery. And adding, that it acts like severe lesions or dangerous maladies, which happening to pregnant women, make them miscarry, or have premature births. But all this we know to be so

perfectly false and at variance with the facts, that it does not merit any refutation.

This property of the spurred rye never to excite uterine contractions except when this organ has a tendency to get rid of its contents at any time, is also remarkable as having been acknowledged and stated in a positive manner by both Balmé and Chatard, who are far from prejudiced in favour of this remedy. Thus Balmé states accurately, that the effects of the ergotted rye are not always confined to the digestive organs, but that they extend sometimes to consentient or neighbouring ones, particularly when they are in a state of action or irritation, as happens in regard to the womb of women who are about to be delivered. Then as to Chatard, he says, that the ergot has not any action upon the womb except during labour, when that organ becomes so much the centre of activity, that it attracts to itself what would otherwise be dispersed over the whole animal system. From all our knowledge in physiology and materia medica, and from what we know of the effects of the ergot medicinally administered, might we not hazard the following explanation: The womb being endowed during gestation with the most exquisite sensibility, perhaps altogether peculiar, and exercising and receiving very multiplied sympathies, it may at the moment of parturition acquire such an increase of sensibility as to be more or less alive to the impression of the qua-

lities of the ergot ; wherefore, from the methodical employment of this medicine, its expulsive contractions are rendered more numerous, prolonged, and active, than from the sole efforts of nature. This explanation will also be found in accordance with the opinions of different authors, who have ventured more or less upon the important question of its *modus agendi*. Such are Bordettes, who establishes, that the spurred rye is the especial stimulant of the womb ; Bogiovanni, who looks upon this medicine as having a special elective action upon this organ ; Prescott, who says, that this substance exerts upon the womb an action superior to all other agents ; Stearns, who considers the effects of the ergot upon the uterus as more certain than that of emetic tartar upon the stomach, or of jalap on the intestines ; Erskine, who thinks, from his trials, that the principal action of ergot is exclusively felt by the uterus ; Henrischen, who thinks it probable that this substance has upon the uterine system an elective action, just as cantharides upon the urinary passages ; an action which Lainé is tempted to attribute to a particular principle, which may be contained in ergot, but which has not as yet been made known by chemical analysis. Lastly of all, the opinion of Goupil is, that the influence of spurred rye is specific, either upon the nerves of the plexus hypogastric, or upon the ganglions from whence they arise : an action similar to that of

different poisons. And if so, he adds, that compression of the hypogastric plexus, or its pathological state, would render the administration of this remedy of no avail. Lastly, in pursuing the comparison of the especiality of action, we might say, that the uterus, at the moment of parturition, might acknowledge in the ergot of rye its peculiar stimulant, just as the salivary glands, the stomach, the rectum, &c. are constantly stimulated by mercury, ipecacuan, aloes, &c.; which is, perhaps, little better than endeavouring to explain the *ignotum per ignotius*, &c.

CHAP. XI.

ON THE FAILURES OF SUCCESS OF THE SPURRED RYE.

WE may consider the failures of this remedy under two different points of view. First, as happening in a few distinct individual cases; and secondly, as taking place in a pretty considerable class of persons, to whom this medicine appears to have been administered in a suitable manner. In the first instance, it is evident that the want of action must arise from the particular temperaments of the individuals; whilst in the second, every thing leads us to believe, that the want of effect must have depended upon the particular quality of the ergot of rye which was employed.

Like a number of other medicinal substances which act with more or less energy upon our frames, spurred rye produces at times no sensible effect, although given under the most proper circumstances, and in doses sufficiently large. This remarkable phenomenon, which arises from the idiosyncrasy of the patient, and which Hosack attributes, in a general way, to the ill-timed employment of the remedy, ought not to surprise any of those persons in whose hands opium, cinchona, emetic tartar, mercury, &c. all suitably administered, far from proving at all times useful and efficacious remedies, are sometimes of no effect, and even prejudicial. And here we ought to remark, in favour of the ergot duly administered, that if in some cases it seems to be altogether inert, yet it never occasions any accident. For we disagree altogether with Hall, who says, that wherever it fails in producing uterine contractions, it produces more or less of general constitutional derangement.

Some are of opinion, that the general causes of failure of this remedy is its not being given in doses sufficiently large. This we deny, for we think that when given to the extent of sixty or eighty grains in the course of some hours; if it then fails, we ought not to go beyond this quantity, at least until from some new and successful experiments we may be permitted to act otherwise. Various explanations have been

offered as to the causes of failure in various cases. The staleness of the ergot, either in the state of grain or in powder, being considered as a circumstance which diminishes its deleterious qualities, it has been thought, that amongst several cases of failure, use had been made of some old ergot, or of a powder too long kept. M. Desgranges, in particular, is of opinion, that in becoming old, the ergot of rye loses its power over the uterus. It would be right, therefore, in all cases, to use only the freshest ergot we can procure. M. Baudeloque however thinks, that in very rainy seasons the viscid yellow fluid proceeding from the *sphacelaria* before noticed (page 6), and which flowed over the grains of the rye, being washed off, and the fungus itself been melted down, detached, and removed, is so completely separated from the black grains, that they no longer retain any of their peculiar properties. He also thinks, that this will more readily happen in case the rye has been carried into the barn, and threshed out before the ergotted grains have been selected, as then the friction and carriage, &c. may have detached the exterior scales, upon which it is most probable the activity of the ergot depends. And from this his notion, that the minute mushroom already described constitutes the most essential part of the ergot, Baudeloque adds, that it would be of great consequence to gather the grains whilst upon the ears, before they were reaped; and to choose,

in the preference, the ergots upon which the spha-celaires were still adherent. But as this is merely hypothetical reasoning on the part of M. Baudeloque, and not supported by the facts of the case, we are not inclined to place much reliance on it, as we know the ergot has been found quite efficacious, even when it has been carelessly treated, and suffered friction during long journeys, &c. Another manner of accounting for the inefficacy of the ergot has been imagined by M. Balmé, and in some degree established by him; and his opinion is, that the physical properties of this grain vary according to the climate. Thus, in those countries where the use of ergotted rye is followed by accidents, the interior substance is of a whitish grey, gluey, very difficult to break, and also exhaling a mouldy smell, and strongly impressing upon the tongue an acrid taste; whilst in those countries where complaints are but seldom made of its bad effects, this same substance is white, farinaceous, and devoid of acrimony. If this assertion were demonstrated, still we should have every reason to believe, that in more than one case where the ergot had been employed without effect, this grain, nevertheless, possessed all the conditions which render it active. Besides, the ergot gathered during years of continued rains, having been generally regarded as less active, it has been conjectured, that what had been employed in the case in question, proceeded from a crop of this

kind; but the humidity of the atmosphere being one of the circumstances which preside at the formation or development of the ergot, it is difficult to conceive that a little excess of humidity could destroy more or less completely the usual qualities of this sort of grain. These different suppositions and hypotheses, announce pretty evidently that the ergot of rye (of which we have said that Wildenow admitted two species) presents modifications in its very nature, or that otherwise it is not always identical; which may be owing to different influences under which it is exposed, like all other vegetables. These might put us into the way of discovering the cause of these trains of failure, of which several writers make mention; for every thing leads to the belief, that it is in the particular qualities of the grain employed, or of its powder, that the causes of these failures reside.

It may therefore be laid down, that in this case the spurred rye, which Chapman regards also as a transitory uncertain therapeutic substance, either did not possess, or had lost, the particular qualities which render it proper to act, especially upon the uterus during parturition; qualities which we know not exactly how to describe or point out; but which ulterior observations may no doubt hereafter discover; whence M. Giraud Saint Rome has said, that the ergot of rye is as yet merely on its trial.

To arrive the more speedily at some just conclusions, we would observe, that it is requisite on one part, carefully to study all the circumstances of those cases wherein the ergot is administered ; and on the other, to determine all the different conditions which this remedy presents. Thus, for instance, in regard to the women, according to M. Balmé's suggestion, it is always essential to ascertain the state of the stomach at the time of giving the remedy, as it may perchance contain matters susceptible of modifying the effect, or at least some sort of viands capable of producing analogous results. As to the ergot itself, the subject of such various opinions both as to its nature and properties, the necessity must be felt of studying it anew, not only in its entire state, but also in the different alterations of which it is susceptible ; such for instance as that of which Mitchell speaks, when altered by the presence of a certain quantity of insects, which in his opinion must give it certain novel qualities, which he compares to those of cantharides.

However that may be, the frequent want of action of the ergot, altogether accidental, having served as a basis for the too exclusive opinion of many physicians in regard to its uses in child-birth ; it has thence resulted, that some grant it only very doubtful uterine properties ; and that others would completely reject it from the list of the *materia medica*, as being a substance wholly inert.

In the number of the former are Desormeaux, who says with a prudent degree of reserve, that although the experiments have not been very favourable, we ought to be in no haste to pronounce judgment upon the spurred rye: Gardieu, and Martin Solon, who look upon it as a doubtful and uncertain remedy, but who advise nevertheless to make new experiments, particularly in cases of uterine hemorrhage, establishing that a single case of flooding stopped by this remedy, would be more demonstrative of its action upon the contractibility of the womb than all that has been reported upon its obstetrical qualities properly so called: Philibert, who pretends that the ergot has not maintained its reputation, and that new experiments are requisite: lastly, M. Vauquelin, who in his lectures concludes that this substance yet requires to be studied.

Amongst the second class are Le Mercier, who has found the ergot altogether inefficacious, either in quickening child-birth, or in favouring the expulsion of the placenta: Le Maire-Lysancourt, who, during a sitting of the Section of Pharmacy of the Royal Academy of Medicine, sustains, after Beclard, that the ergot possesses none of the advantages attributed to it; an assertion combated by Caventon and Chevallier, who quote facts favourable to the obstetrical employment of this substance: Bassett and Legouais, who without possessing any facts to be opposed to authentic

cases, affirm in the most positive manner, that if this substance obtains some appearance of success, it is because it has been administered precisely at the moment when nature was about to resume her work; a strange mistake surely, considering the numbers and talents of the persons who have thus been duped. According to this false way of reasoning, we might deny to all medicines, even the most energetic, the properties which they always manifest. Thus we might as well say, that an accession of fever had not taken place in a person labouring under that disease, not because he had made use of the cinchona, but only because the accession which we expected was not to take place; or that an individual had vomited after taking emetic tartar, only because the stomach was about to reject its contents at the moment of taking that remedy.

To those persons who, although refusing any obstetrical virtues to the ergot, yet admit that it never produces any disagreeable effects, we must add two other authorities, namely, M. Chaussier, and Madame La Chapelle, who, endowed with great talents for her task, and strengthened by a great many negative facts observed by herself, under the eyes of M. Chaussier, gives us the result of her opinion of the total inefficacy of the remedy. We would even add, that M. Chaussier, when presiding as professor at the reading of M. Bordot's thesis upon this subject, made a memo-

random on it to this effect; that after a great many experiments it was proved, that this substance produced no effect. And in conclusion we must add to the list of negatives, the opinions of Duges, who, in a few lines bestowed upon it, accuses it of total inefficacy.

CHAP. XII.

HARMLESS QUALITIES OF THE SPURRED RYE WHEN GIVEN MEDICINALLY—IMAGINARY ACCIDENTS ATTRIBUTED TO IT.

THE physicians who have declared themselves adverse to the medicinal employment of the ergot of rye, have made use of the following points of argument:

1st, The deleterious effects produced by bread containing portions of this bad grain.

2dly, On account of some original or secondary accidents which might supervene with those females after the remedial employment of this substance, and which they attribute to it more or less gratuitously.

3dly, Pretended bad effects which result from it in the person of the infant.

4thly and lastly, From the culpable abuse which might be made of it, as a substance causing abortion.

We shall point out in this chapter, which we shall divide into four sections, the want of foundation for these capital charges, without deigning to notice those vague complaints, those unfounded fears and absurd apprehensions which have led some authors to desire, without any positive motive, that no use should be made of this substance.

SECTION I.

As it is of importance to convince those who are hostile to the ergot of rye, of the harmlessness of this substance when suitably administered, and also of giving confidence to the timid as to its employment, we should first remark, in order to destroy, as far as lies in our power, the principal charge against it, that there are a whole host of facts which prove, that many individuals have eaten for fifteen or twenty days of bread into which this diseased grain entered, in the proportion of an eighth or even a sixth part, without experiencing the smallest inconvenience therefrom; and that there are many instances of persons who, at the end of a considerable time, have suffered nothing unpleasant; a circumstance which Pentrin has generally remarked in Silesia. Besides, it is generally acknowledged that, in the proportion of one twelfth, this bad grain has not caused any

accidents ; as indeed the panary fermentation and the baking must no doubt modify its effects. In the next place, we should quote the experiments of Parmentier, who took every morning, on an empty stomach, during eight days, half a drachm of the powder of ergot without experiencing any inconvenience. "My sleep," says he, "was tranquil during all the time, nor had I the smallest headache." But fearing that the ergotted rye thus taken, without having been fermented, had not the noxious qualities of which it has been accused when it exists in the form of bread, Parmentier mixed some powder of ergot, in the proportion of a fourth, and even a third, with common flour, and had it made into bread, of which he ate, and also gave it to several animals, but without producing the smallest bad effect.

Maier, as reported by Wesener, took also, but in increasing doses, some pure ergot, to a very considerable amount, and without being at all affected by it. Goupil relates, that several times before he ventured to prescribe to others a drachm and a half of the spurred rye, he had himself taken two drachms, and even two drachms and a half; and that sickness and vomitings, with colic pains and head-ache, were the only bad effects he experienced, and which he attributes to a very high degree of irritability in the mucous lining of his stomach and intestines. Cordier, who made the same experiment, but with the ergot in grains,

which he masticated before swallowing it, experienced pretty nearly the same phenomena, and also some acrimony in the mouth, and a degree of salivation. Another individual wishing to make the same experiment, experienced, on taking the first dose, vomitings which prevented him from pursuing his essays, but which produced no other bad consequences.

Lastly, we ought to quote the trials pointed out by Chapman, and made by Erskine; from which it results, that the ergot administered to males never produced any change in the state of the pulse, and that vomitings and nausea never supervened until the dose (which is not stated) was carried to too great a quantity.

SECTION II.

After the facts we have just stated, how is it possible to believe that twenty or thirty grains, or even a drachm of this substance given at one time, and almost always in fractionary parts, could cause the smallest accident, or the least disagreeable result, either immediately or consequently.

And this we should say, because if even in the first moments after its being received into the stomach it should cause vomitings, no one could count these as accidents, since they come on very frequently of their own accord during parturition, and since in general they hasten it; so that, as every practitioner knows, it is a good practice to

prescribe them, by way of exciting the contractions of the womb.

Then as to convulsions, of which some authors have spoken, and which they have accused the spurred rye of having caused, there does not exist, up to this time, any case in which they have arisen after its employment; although the opponents of this remedy accuse it of only accelerating parturition by convulsing the uterus. And on this occasion we ought to repeat the judicious remark made by Baudeloque, that to be called convulsive it is not sufficient that the uterine convulsions should be much stronger and more violent than is natural, but that they ought also to be irregular, without order, and dangerous; a state which has never been remarked by any author, and which, in one word, has never taken place. Nevertheless, as even where general convulsions do come on after the giving of the ergot, these might depend wholly on another cause; since this accident does happen but too frequently with women in child-bed, it is quite clear that we can have no right to attribute them to the use of this remedy where any other cause coexists. And in support of this opinion we must state a fact reported by M. Baudeloque, of a young woman between sixteen and seventeen years of age, who having taken fifty grains of the spurred rye to hasten her delivery, was seized with convulsions at the moment when the head of the infant began

to escape from the pelvis. By the aid of the forceps she was delivered of a child, which was still-born. This female was of a sanguine temperament, in whom the symptoms of cerebral congestion had preceded the convulsions ; so that there was nothing in this case which could be imputed to the new remedy employed ; the female in question reuniting in her person the majority of circumstances predisposing to or bringing on convulsions. As to the death of the child, neither does that present any thing remarkable under similar circumstances.

Lastly, we should mention here the fears expressed by M. Broussais as to this remedy ; as he thinks that it must produce painful consequences to the nervous system, and thereby occasion a rupture of the womb ; because the womb might contract too violently, and give way to its own contractions : and he adds, that this remedy can have no more efficacy against the torpidity of the uterus, than the *nux vomica* in paralysis.

Whatever may be the authority of this celebrated professor, we are far from participating in his fears as to the remedial employment of the ergot of rye ; being well assured that they have their origin rather in the general system of medicine, which he has undertaken to establish, than in any observation of facts to justify his apprehensions. In opposition to all these fancies, we may quote Mr. Waterhouse, who looks upon the ergot as

being of admirable efficacy in case of puerperal convulsions, an opinion which he founds upon a fact to be quoted by us hereafter.

Independently of Broussais, who fears the stimulating action of this substance upon the stomach, some authors, with Legouais, reckon up several other dangers, as those of gastritis, peritonitis, and metritis, as likely to follow the use of the ergot. The absence of every sort of fact in favour of their assertion, joined to all that has been already stated in this chapter, ought to dissipate every apprehension of this kind; as there does not exist any where, to our knowledge, any case of gastritis or enteritis having ensued either from the curative use of this substance, or from its accidental employment as food, at least during the early times. As to peritonitis or gastritis, as coming from this cause, we do not know of any clear case; because we do not, like the opponents of the ergot, consider that abdominal phlegmasia, of which traces appeared in the body of the woman whose case is stated by Desgranges as arising from the use of this remedy; which in this case was most clearly administered at a very improper time. We shall quote literally this case, almost always garbled by our adversaries, and upon which they are so fond of grounding their attacks; so that every one may judge for himself on which side the truth or the error lies.

These are M. Desgrange's own words: "In

the first place I ought to declare, that I did not myself witness this case, borrowed from the obstetrical practice of one of my junior colleagues; but having learnt from him that he had administered the ergot, I requested to be informed of the result. I learned, in his presence, that it was the case of a poor girl, found lying on the pavement of the streets of Lyons, begging, starving, and labouring under sickness. She was suffering, had undergone all sorts of privations, and was extremely weak. Her pains, which were thought to belong to the act of parturition, were as slow, feeble, and lingering as they could well be, but more on account of her general state of debility than from any real torpidity of the womb." The remedy was administered and delivery took place.

"The first effect of parturition by the removal of the burden, and a *slight* loss of blood thence resulting, appeared to relieve this unfortunate young woman, who, in spite of every care bestowed on her, died on the eighth day. The opening of her body discovered the traces of a slight peritonitis, and of a slow chronic phlegmasia. The accoucheur acknowledged that the womb was without any apparent change, at least in the eyes of those accustomed to examine the bowels of women dying at various periods after their delivery. Neither of us doubted that this young female had contained in her own system the elements of this stage of

inflammation before having been received into the Hospital de la Charité, and being there put to bed; and that it was at the time of the milk-fever that this had put on the character of acute disease; perhaps even at this very time too there was epidemic in the hospital a sort of puerperal peritonitis. At all events, it may with truth be said, that the remedy did not seem to have been indicated; but there existed then a wish to try it, and the occasion was thought to have been favourable. Certain however it is, that this was not exactly a case for hastening delivery, or even to provoke it by a specific uterine stimulant."

Such then is the case quoted so often by all the decriers of the ergot of rye, and which, in our opinion, proves so little against that remedy, that it would be a work of supererogation to enter into its justification. The same may be said of the fact reported by De la Prade, &c. &c.

SECTION III.

If several hundreds of deliveries, which by the aid of the spurred rye have terminated as happily for the infant as for the mother, were not sufficient to prove that this substance is equally safe to both, one might in some degree partake of the fears expressed by certain physicians upon the effects which might result from it. But the ergot having no other effect than that of awakening or inducing the uterine contractions, and that only in

such a degree as we can control by art, there can result from its medicinal employment no action noxious towards the child, nor any mechanical hurt springing from excess of activity in the contractions of the uterus. But this substance has also been accused of injuring the child mechanically, and even of causing its death, in consequence of the violence of the uterine contractions thus artificially excited; which, it has been said, may even produce asphyxia, by obliterating the circulation between the placenta and the infant.

This objection has been raised not only by Dyckman and Moore, but by an anonymous American author, mentioned by Prescott: and as this accusation would be a grave one if well founded, we will quote the single fact on which it has been reared. "A female was pregnant with twins. The first was brought away alive by means of the forceps; the second was expelled dead after the use of the ergot, found necessary from the cessation of the expulsive pains." Thence the immediate conclusion formed by the anonymous writer, that the ergot of rye caused the deaths of the children, by inducing too strong and rapid contractions of the uterus. One may so easily conceive all the objections which might be produced against so absolute an opinion, that I will not insult the reader's good sense by detaining him on this point.

SECTION IV.

One of the most severe charges brought against the ergot of rye, is that of its being able to produce abortion, and therefore being one of those dangerous articles the sale of which ought to be legally prohibited, in order to prevent its culpable employment. Thus Gerardin says, that it is an opinion generally received in the colonies, that the spurred rye is a certain means of producing abortion; an accident which Goupil, in the corollaries which conclude his excellent treatise, regards rather as being possible than proved. No doubt it is from a similar belief that Henry Pelletier and Planche, in a report made to the French Minister of the Interior, in the name of the Royal Academy of Medicine, have recommended the exclusion from France of a certain quantity of ergot of rye; and that Rose and Guibert have viewed with fear, the increasing administration of this remedy. To these we may add Lorinser, quoted by Hufeland, who accuses the spurred rye of causing abortion by means of flooding; whilst, in fact, we know that this is an accident which this remedy has the power of stopping. We would therefore repeat, that even when the ergot has been taken in quantities as an aliment; it has never caused immediate abortion. In the next place, every thing seems to prove, that the ergot of rye has no action upon the

uterus, except when this organ, charged with the product of conception, tends to get rid of it, either prematurely or at the ordinary period of parturition. We know but a single fact to weaken this assertion, if indeed that be authentic. It is that quoted by Waller, who says, that he knew of a case of abortion brought on two hours after taking the ergot wilfully, by a female two months pregnant. But a single fact of this kind, unaccompanied by any particulars, and not witnessed by its relater, who does not even point out its source, and which besides is in contradiction to all that we know on the effects of the ergot, ought not to be allowed any weight. Lastly, we shall report what has been witnessed by Stearns, who mentions, that two persons had given, with culpable intentions, in cases of illegitimate pregnancy, the decoction of several ounces of spurred rye, and that during a certain time, without any bad result. He also adds, that we ought rather to attribute the accidents which may arise during the medicinal use of this remedy, to individual or casual circumstances, than to the substance itself. Let us state, that Hall considers the ergot as incapable of producing abortion, being, as he says, most frequently vomited without having produced the slightest effect, either on the womb or its contents. He even adds, that having employed it in a case of threatened miscarriage, attended with flooding, the

precursory symptoms of abortion had ceased, and the woman completed afterwards her full period of pregnancy.

CHAP. XIV.

ON THE USE OF SPURRED RYE IN VARIOUS MALADIES CONNECTED WITH THE UTERUS.

IN this chapter we shall treat of the employment of the ergot in the following predicaments :

1st, As favouring the expulsion of the placenta. 2dly, As accelerating, in cases of abortion, the expulsion of the whole or the remnant of the ovum. 3dly, As restraining uterine hemorrhages. 4thly, As producing the expulsion of clots from the womb. And 5thly, As being the means of moderating the lochial discharge. And we must here commence by stating, that from analogical reasoning this substance has been prescribed and employed by Dr. Beckman as an *emmenagogue* ; although, on the contrary, Lentin, Taube, and other writers have recorded, that amenorrhœa is generally an attendant upon cases of ergotism. Chapman says, that the ergot has been used as a remedy for hemorrhage ; and Hall mentions, that on being administered in several cases of amenorrhœa, he observed that the ergot produced a

considerable degree of derangement in the system, accompanied by pains in the epigastrium, and vomitings; which no doubt arose from the particular susceptibility of those to whom it was given. Prescott positively affirms, that the ergot of rye has no emmenagogue virtues.

But Dr. Davies, after stating that amenorrhœa is most commonly the effect of general indisposition, rather than any defect of vital powers in the uterus, yet advises the use of the ergot in such cases, and that it should be persevered in for some time. Nevertheless, although this substance may not be capable of producing a flow of the monthly evacuations from the unimpregnated uterus, it must be acknowledged, that in all cases where an ovum is present, there exists at least a great chance that its use may cause abortion.

ON THE EXPULSION OF THE PLACENTA.

The expulsion of the pulpy mass of placenta, as well as that of the fœtus, although much more rarely, may be retarded for an indefinite time by the torpidity of the womb. Although in this case art possesses several resources well known to all professional men, yet as all these, with the exception of the manual extraction, will occasionally fail, and as even this last expedient may be rendered very difficult (should any casualty have separated the umbilical cord from the placenta), the ergot may then prove a very valuable remedy.

But here, as there is not so much need of strong muscular contractions, it will not be necessary to give the ergot in full doses, and instead of giving it to be swallowed, it may be advantageously employed in *lavemens*. Bordot relates the following case (No. 10) in his last pamphlet: “ Madame Rem - - -, aged twenty-three years, of a very small and delicate form, had been delivered the preceding year of a still-born child; I was called to her in the seventh month of her second pregnancy, on the 31st March, 1825, at six o’clock a. m. She had suffered several pains in the course of the night, and the parturition soon followed. In fact, I arrived just in time to put a ligature on the umbilical cord. The placenta not being loosened, I waited in vain for an hour, in hopes that the coming on of further contractions might favour its expulsion, and tried by gentle pulling to detach it, but without effect. Before introducing my hand to lay hold of it, which is never without its inconvenience, I caused her to swallow twenty grains of what I call the *ocytotic* powder (*pulvis partum accelerans*, the powdered ergot of rye), mixed up in a little orange-flower water; about five minutes after taking it, a single pain sufficed to expel this fleshy substance.”

Dr. Balardini reports another instance, which proves still better the important services which the ergot of rye may render in certain difficult cases of occasional occurrence. With a woman

whose age is not stated, three days had elapsed without the after-birth being expelled; the uterus was soft, and without either pains or contractions, and a small degree of hemorrhage continued. Every attempt at extraction was resisted, through misplaced fear or modesty. Thirty grains of the spurred rye aroused the pains afresh, and caused the expulsion of the placenta without any accident.

After all that has been already said, the reader will not be surprised to hear, that this remedy has been also accused of having caused the retention of the placenta, when it has been given in the course of the labour, that is to say, for favouring the expulsion of the foetus! But has such an assertion any need of being refuted?

ABORTION.

According to the reports of several authors, and more particularly of Prescott, the spurred rye has also been employed successfully in accelerating delivery, or, in other words, the coming away of the whole product of conception in cases of miscarriage. This author particularly points out the virtues of this substance in abortions coming on in the early months of pregnancy, attended with hemorrhages; the cessation of which has been quickly followed by the expulsion of the embryo and its appendages.

This remark of the American physician, and our own observations, induce us to conclude, that the

ergot of rye ought never to be given in threatened abortions without any discharges; and which also the less require the employment of this substance, because the pains are always more or less lively in such cases; and these, as well as in regular labours under the same circumstances, are better aided by the use of baths, and emollient fomentations, &c.

And here we ought to lay down a maxim of the greatest importance; and which is, that we ought never to prescribe the spurred rye excepting when we are morally certain that abortion is inevitable. The dose too of the remedy in such cases, ought always to be much smaller than in accelerating the delivery of a full-sized child. We have not found in authors any detailed relation, or particular instance, of the employment of this remedy in aiding abortion. Balardini and Dr. Davies only say, that they had both employed it with success, in a case of abortion, where the placenta had remained after the coming away of the foetus.

UTERINE HEMORRHAGE.

The American physicians were the first to proclaim the virtues of the ergot in cases of this kind. Chapman looks upon it also as one of the best remedies to check flooding, not only after the delivery of the foetus, but after the coming away of the placenta, when it has been given during parturition; and considers it in such cases as a

preservative against the occurrence of flooding. Hosack even, who is far from being partial to this remedy, considers it as especially useful in floodings arising from the placenta being attached over the cervix uteri, for he observes, there is less danger then in employing the ergot, the mouth of the uterus being dilated, than in introducing the hand and turning the child. Here the spurred rye would possess a threefold advantage; first, by stopping the hemorrhage by the first contractions of the uterus, which it would produce; next, by hastening the delivery; and thirdly, by preventing any farther flooding. The same author extols this remedy in long continued losses of blood from the uterus, arising from general debility. He enumerates an instance of a woman, aged fifty, who had a chronic flooding, which no other remedy had been able to stop, and who was cured by three doses, of ten grains each, taken in the course of a day. But Goupil relates, that in a case of the same kind, M. Andrieux had met with no success from using the ergot.

Three other American physicians, Stearns, Dewees, and Church, also advise, that the ergot should be given as a prophylactic, whenever we have reason to fear the occurrence of flooding, particularly when the patient may have suffered from it during a previous delivery. Dewees relates one case where, according to every probability, he had obtained a successful result by this

means. It was that of a female who had had, after six previous children, frightful floodings; and the ergot being given at the time of her seventh child, she had not suffered from any flooding. In Italy Bigeschi has obtained the same result. In France, Bordot, Goupil, and Prefet, have also been successful in checking uterine hemorrhages after delivery, by the same means; and several other physicians have praised its use in similar cases. The employment of this remedy ought not to prevent the use of other preventive measures at the same time, and the dose of the medicine ought not to be too small; and we may also give it freely here in lavemens.

The following cases will serve to illustrate our meaning. This case comes from M. Bordot:

“Madam Chev - - -, aged thirty, of an irritable habit, although strong, had been already in child-bed twice, but had then suffered much. Being called to her on the 17th November, 1825, I found her in great agony; the waters of the amnion had come away several hours before, and the os uteri was nearly closed. As I had attended her before, I prognosticated that the labour would be lingering. Some half-baths and lavemens were administered. The night passed away without any sensible change. She had long intervals between her pains. The next day things were nearly the same; but towards evening the pains were longer and more strong, and the orifice of the womb was

nearly as large as a shilling. The foetus presented itself by the left shoulder; and shortly thereafter having passed the cervix uteri, the right hand presented itself at the same time. I then no longer hesitated upon seizing the feet, which I brought down singly. This operation was very laborious. The infant was still-born, but after a long application of due means, it was brought back to life. As there was a loss of blood from the uterus, I hastened to search for the placenta, in order to terminate the delivery. The flooding continuing in great abundance, I recommended to the patient to lie perfectly still, and immediately gave her fifteen grains of the *ocytic* powder, by way of bringing on some uterine contractions. The flooding was soon stopped; and I felt very distinctly the uterus becoming firm. Every thing reassumed its natural train, and the conclusion of this delivery was perfectly successful, by following all the usual precautions in similar cases."

Second case, related by Goupil :

"Madame F—, already the mother of three children, was delivered after half an hour's expulsive pains, and the placenta was extracted very soon afterwards, by a midwife called to her in my absence, and who assured me she had only made use of very gentle pulling. I arrived one hour after delivery, which had been succeeded by a very abundant flooding, and in spite of the application of iced vinegar and water; and notwith-

standing the hand had been twice introduced into the womb to bring away the clots, the blood continued to flow, and the womb only contracted for an instant, and thereafter became perfectly torpid. This state lasted till the administration of the ergot of rye. Ten minutes after the first dose of twelve grains there was a contraction of the womb, which was prolonged with rather strong pains, and a remarkable return of strength till my departure, about an hour afterwards. On going away I prescribed a second dose of twelve grains, which was given in about half an hour. The flooding did not return, and the lochial flux, without being entirely suppressed, was very trifling. She complained much of colic pains for more than twenty-four hours. The milk fever was very moderate, and, in conclusion, nothing remarkable happened. From all these facts we may conclude, that this remedy, so far from reviving a uterine hemorrhage, as Broussais thinks, has the power of remedying this dangerous accident.

CLOTS IN THE WOMB.

There is sometimes collected within the womb, after delivery, and from a concurrence of certain circumstances, a greater or less quantity of blood, which not being expelled by the efforts of nature, or extracted by art, becomes coagulated within that organ, and by being retained there frequently for several days, brings some unpleasant acci-

dents, as may easily be imagined. The expulsion of this clotted blood, acting as a foreign substance, requiring always immediate aid, the ergotted rye is perfectly indicated under such circumstances.

The following case, which happened to Mackenzie, and is quoted by Waller, proves the success of this remedy :

“ By means of fifty grains of ergot of rye infused for ten minutes in a tea-cupful of boiling water, Mackenzie procured, at the expiration of half an hour, the expulsion of several coagula, which after a delivery of twins had filled the womb, and kept it so much expanded, that the midwife had thought that there had existed a third child.

IMMODERATE LOCHIA.

In Germany, for a series of years, the property of diminishing the excessive flow of lochia has been attributed to the ergot of rye. Gaspar Bauhin has lauded it for this virtue. James, in his great Dictionary of Medicine, whilst acknowledging this property, attributes it, by mistake, to the internal substance of the grains. Hosack and Stearns too, allow that the ergot is useful in these cases ; and more lately Dr. Davies, who appears to think that this remedy only moderates the excess of these discharges, when they are the result of want of uterine contraction ; and who likewise

adds, but without quoting his authorities, that this remedy never having been given alone, it is still doubtful what influence it could have had in obtaining the effect required.

This is all we yet know on this subject ; so that, as in the foregoing cases, authors have left us much to be learned ; namely, whether they have observed the tendency to suppress the first or latter terms of these discharges ; and next, at what particular period it would be desirable to prescribe this remedy, &c. And here, in concluding what we have to say in this chapter, we may report, that an anonymous writer has stated, that ergot of rye is of use in moderating the secretion of milk, but of this he gives no proofs.

CHAP. XIV.

EFFECTS OF THE ERGOT OF RYE UPON ANIMALS.

THE action of this substance upon animals, which are all averse to taking it, may, as in the human race, be considered in two respects, either as it is hurtful or salutary. Different quadrupeds and birds fed entirely or principally upon this vegetable product, have been attacked with accidents resembling those it produces upon mankind ; and in like manner too they experience no bad effects when it is given to them in small doses. Chapman

states, but without quoting any instance or experiment, that when it is given to animals in a state of gestation, that it never fails to produce abortion; while Chatard reports different experiments to prove the contrary. Thus he says, one ounce of the powdered ergot being given to a sow about to farrow, only augmented the secretion of urine, and produced agitation. Three ounces given in two days, to a smaller sow, while in the middle of gestation, producing nothing remarkable. Four ounces of spurred rye given to a cow four months with calf, produced only a temporary loss of appetite. Three ounces given in two days to a she-goat, rather big with kid, produced little suffering. Wasener also states, that he gave progressively up to one drachm of the powder to a spaniel bitch with puppies, which nevertheless went its full term, and that the litter was safely brought into the world notwithstanding; and this experiment was repeated by Dr. Villeneuve with precisely the same result. We may therefore conclude, in spite of Chapman's assertions, that the ergot of rye, if given in certain doses, produces no abortive effects upon animals. Mr. Combes, having made similar experiments, found no action produced upon two bitches; but with the third there came on a violent agitation, and a loss of blood greater than usual, with the expulsion of a litter of four puppies. But as the author neglects to state at what period of the gestation he

administered the substance, we can draw no conclusion from his experiments.

As to its obstetrical employment in regard to animals, it has scarcely been used, as far as we know, except for the cow. The dose has been four ounces of the ergot in decoction, to which some have added four ounces of olive oil. It has been reported, that Dupuy obtained the same effect after injecting this decoction into the veins of a cow (of course without the oil). Percy and Laurent mention, that this same decoction, mixed with half as much brandy, injected also into the veins of a cow, caused the animal to calve speedily. The calves thus born exhibited nothing remarkable, nor did the milk of the cows present any change. It has been stated also, that the ergot has been given to ewes with a view of facilitating their parturition.

CHAP. XV.

OF THE EMPLOYMENT OF THE SPURRED RYE IN PARTURITION — RECAPITULATION OF THE VARIOUS CIRCUMSTANCES WHEREIN THIS SUBSTANCE HAS BEEN EMPLOYED.

WE shall now give a series of detailed observations stating the efficacy, and at the same time the perfect safety, of the ergot of rye in different

cases of parturition, culled from a variety of authors. Secondly, a recapitulation or indication of different circumstances in which this medicine has been administered with more or less success.

First case, by Balardini :

“ A woman aged thirty-seven, in the seventh month of her pregnancy, who had formerly borne nine full-grown children. Pains of child-birth came on with slight hemorrhage ; after seven days of diminution or cessation of pains, takes twenty grains of powdered ergot mixed with wine ; the pains come on for some hours, and then almost cease ; fifteen grains in addition are given, and bring on the delivery of a female child, which lives.”

Second case, by Bigeschi :

“ Woman healthy ; first child. Infant presents the face ; uterus in a state of irritation ; external genital parts swollen ; pains, strong and prolonged, become feeble, and at long intervals ; thirty grains of ergot bring on new pains ; delivery takes place at the end of half an hour.”

Third case, by M. Bordot :

A woman of thirty-six years, ricketty subject : had been delivered of first child by means of forceps ; extreme weakness, no pains ; thirty grains of ergot bring on delivery. The particulars are—
A woman aged thirty-six, of a ricketty habit, had been already delivered four years ago with the aid of the forceps. Being called upon on the 2d

November, 1824, at seven o'clock in the morning, to attend her, I found her so weak as scarcely to be able to walk, and the slightest uterine pains made her fall into fainting fits. She had great dread of her delivery, fearing that it might be found necessary to apply instruments. The orifice of the womb was sufficiently dilated, and every thing announced an approaching delivery. I endeavoured to support the patient's spirits, but to no purpose. I waited patiently for several hours, and every appearance seemed to prove that it would be requisite to employ the forceps, after having broken the bag of waters; but after having assured myself that there existed no malformation of the pelvis, I wished to try the effect of thirty grains of ergot, which she swallowed in a mixture of orange-flower and mint water. The pains were not slow in coming on; the pulse became full and frequent; her strength was increased; and the infant, which was not full grown, was soon between my hands. The uterine contractions then ceased all at once, and I was obliged to employ gentle pulling at the umbilical cord to extract the placenta, which was already detached."

Fourth case, by Chatard:

"A woman had been suffering for nine hours the pains of child-birth, which had produced but little change in the state of the uterus. She had taken an infusion of thirty grains of the ergot of rye. Ten minutes after there came on expulsive

pains, which in less than half an hour produced a happy delivery.”—N.B. Chatard thinks that nature rather than the medicine acted in this case.

Fifth case, by Chevrue! :

“ A woman aged thirty, ricketty from her infancy, in height three feet eight inches, entered the hospital on the 22d February, 1823. She had suffered in the morning, and had had since mid-day very violent pains; at ten o’clock at night the head was still at the upper brim of the pelvis, and the orifice of the uterus dilated as large as a dollar. From this woman’s make I feared much that she would not be delivered *naturally*, if the infant should prove rather large; but I was encouraged in measuring the basin with a pelvimeter, and finding three inches six lines of diameter at the upper orifice. I then administered an infusion of thirty grains of ergot. In ten minutes after the pains became expulsive; about an hour thereafter the pains vanished. At midnight the midwife of the hospital, having examined her, was greatly surprised to find the head pressing upon the perinæum; and the more so because the patient, using all her efforts in expelling it, made no noise, which made her believe she was not suffering. In a quarter of an hour she was delivered of an infant of the usual size, and healthy. She left the hospital six days afterwards quite well.”

Sixth case, by Dr. Clark :

“ A woman aged twenty-eight, pregnant of her

second child. Strong pains for more than twenty-four hours, without advancing the labour. Twenty-four grains of the ergot bring on the expulsive pains, and delivery takes place at the end of half an hour."

Seventh case, by M. De Montmahon:

"A woman aged forty-two, in her fifth pregnancy. Torpidity of the womb for twelve hours; three-quarters of an hour after taking the ergot the delivery is accomplished."

Eighth case, by Desgranges:

"Woman in her sixth pregnancy—a twin case. After a short labour the first child born perfectly healthy; an interval of fourteen hours occurs without any pains; the midwife administers infusion of ergot; at the end of half an hour the second child is expelled living, and stronger than the first."

*Eighth case, by the same:

"Woman aged twenty-three, in her third pregnancy; labour suspended during fifteen hours; decoction of a drachm of ergot given in an enema; delivery at the end of twenty-five minutes."

Ninth case, by Madam Lachapelle:

"Woman with a first child; cessation of pains at the end of fifteen hours; thirty grains of ergot given; delivery takes place in half an hour; but the author doubts nevertheless of the efficacy of the remedy."

Tenth case, by Merriman:

"A woman, aged thirty-seven, in her eighth

pregnancy—twin case. The first is born dead; pains cease after fifteen hours; infusion of one drachm of ergot given; one hour thereafter a child born in good health.”

Eleventh case, by Serrurier :

“ A woman thirty-six years of age, very irritable; a first pregnancy. At the ninth month symptoms of a dead child; at five o'clock p. m. first pains very slight, and quite ineffectual; at seven o'clock very strong pains, which soon cease; at eleven o'clock twenty grains of ergot given; and very soon afterwards she is delivered of a dead child, quite putrid.”

Twelfth case, by the same :

“ A strong woman, aged thirty-two; her fifth child. After a labour of twenty-nine hours pains almost cease; ten grains of the ergot awaken them. Delivery at the end of three-quarters of an hour.”

Thirteenth case, by Goupil :

“ A woman of thirty-three years, whose father had fallen a victim to a disease of the heart, had complained for a long time before being pregnant of dyspnœa, and pains in the region of the heart, and of palpitations. At the sixth month of her pregnancy this state was aggravated by unlucky circumstances, and became truly insupportable. The employment of leeches and venesections, and of all the other means usual in such cases, producing only very momentary relief, and even at times scarcely any. The constant abuse, although

not acknowledged, of strong liquors, and violent family disputes, much overbalanced all the advantages of any medical aid. During the last month of her pregnancy, not being able to lie down, she was forced to sleep propped up in an easy chair.

“From the first days of January, 1824, the uterine pains were perceived, but still without any dilatation of the orifice; and only on the 23d, in the evening, labour commenced by very violent pains in the loins. Violet flushings of face and dark purple lips, projection of the eyes, as if starting from their orbits, and threatening suffocation, rendered it necessary to bleed her twice. All these symptoms continued on the morning of the 24th, and there seemed an urgent necessity for terminating her labour immediately. Still the os uteri dilated but very tardily. Half a drachm of the ergot was given in two doses, at the interval of fifteen minutes. The pains in the reins soon became more intense; then became continual; and in three-quarters of an hour after taking the second dose her delivery was accomplished with ease. The infant lived and did well; but the mother only survived a few months.”

From the different cases we have stated, and likewise from all those which have come to our knowledge, and which are enumerated in the sub-

joined table, it is certain that the ergot of rye has been administered without inconvenience, and we may say with equal success, to women under very different circumstances. Thus—

1. Some were in their early youth, whilst others again, far the greater number, were already of a certain age.

2. Some few were of a sanguine temperament, but the greater part were leuco-phlegmatic persons.

3. Some were very irritable, but many more were not at all so.

4. With some, when in their unimpregnated state, their menstruation was regular and abundant, but with others there was a contrary state; and in all, this remedy had no effect afterwards on their menstruation.

5. Some had a good constitution, while others were more or less feeble, either from birth or accident; and some even were rickety.

6. Several were sufferers from severe moral afflictions; some even were prepossessed with an idea that they should die in childbed.

7. A few were cases of first labour, whilst others had borne eleven and even fourteen children.

8. Some had before undergone laborious and difficult accouchement, even requiring the aid of instruments.

9. Some who had suffered from hemorrhages and convulsions in previous deliveries escaped them entirely.

10. With a few there existed great sensibility, irritation, and even pains in the umbilical region and os uteri, appearing to denote the approach of metritis, or peritonitis; maladies, however, which have not ensued. One too had a considerable degree of anasarca.

11. In several, labour more or less advanced had lasted for three or four days, and had been suspended from twelve to fifteen hours; the waters in nearly all had flowed away for a longer or shorter time.

12. Some were twin cases, others had bulky and strong children; whilst in others the foetus had been dead for a longer or a shorter time; others had unnatural presentations.

13. Lastly, in regard to the doses and effects of this medicine, some women only took ten grains, whilst others took a drachm, or even more, which in most cases brought on delivery within an hour; whilst with others again the remedy did not act so speedily, or indeed altogether failed.

A TABLE OF THE CASES OF THE ADMINISTRATION OF
ERGOT OF RYE,

PUBLISHED UP TO JUNE 30, 1827.

	Names of the Authors.	Numbers of Cases.	Perfect Success.			Incomplete Success.	Failures.	Bad Results.
			Births.	After - Births.	Floodings.			
1.	Anonymous, by Balme .	2						2
2.	Desgranges	7	5				1	1
3.	Prescott .	1						1
4.	Balardini	3	1	2				
5.	Bigeschi	19	14			4	1	
6.	Bordot	18	13	2	2	1		
7.	Bourdettes	1	1					
8.	Brinkle	1	1					
9.	Briot	3	3					
10.	Chapman, Dewees	200	200					
11.	Chatard, James	12	2				7	3
12.	Chevruel	33	28			5		
13.	Clark	3	2				1	
14.	Cliet	1						1
15.	Combes	3					3	
16.	Davies	11	8	1		1	1	
17.	Desgranges	18	15			1	2	
18.	Duviard	1	1					
19.	Foot	4	4					
20.	Gardieu	1				1		
21.	Gilibert	1						1
22.	Goupil	26	18		1	2	5	
23.	Henrischen	2						2
24.	Hosack	3	3					
25.	Huchedé	2	2					
26.	Lachapelle	54	2				52	
27.	Lobstein	12	12					
28.	Mandeville	1			1			
29.	Mercier	1					1	
30.	Merriman	2	2					1
31.	Mey	1						
32.	Montmahon	1	1					
33.	Olivier	1	1					
34.	P - - -	2	1		1			
35.	Pistre	1	1					
36.	Prescot	57	50				7	
37.	Serrurier	1	1					
38.	Stearns	200	200					
39.	Villeneuve	9	7			1	1	
40.	Waterhouse	1	1					
		720	600	5	5	16	82	12

NOTES ON THE PRECEDING TABLE OF CASES.

- No. 1. Desgranges thinks, that in neither of these cases was the ergot indicated, and that the results were not owing to the remedy.
2. In two of these cases the ergot was given in *lavemens*. One was the case of the beggar girl before related, at page 73.
3. See page 76 ; the case of twins.
4. One a case of miscarriage at five months, where *foetus* was born five hours before. The other a placenta retained three days in the womb, and from false delicacy woman refused all aid.
5. These prove that ergot is as successful in a warm as in cold climates.
6. We regret that Bordot has only given his successful cases.
7. In this case the uterine torpor was such that the use of the forceps was meditated.
8. A case of convulsions, which came on during labour, where the ergot seems to have been successfully used. See page 35.
10. These Americans seem only to have mentioned their successful cases.
11. The three fatal cases not owing to the ergot.
12. In these thirty cases two children were born dead ; one had been dead for some days, and the other strangled by the umbilical cord.
13. In the unsuccessful case the forceps was applied, and the child dead born.
21. In this case, a month after the medicine, a fever came on, which proved mortal.
23. In the two bad cases the medicine had been given out of time, as admitted by Henrichsen himself.
36. Of these fifty-seven cases twenty-two were women with their first children ; and of these four were still-born. The other thirty-five only lost one child.
39. In the case of failure, the woman vomited two doses of thirty grains each, and she was delivered by forceps.
40. A case of puerperal convulsions, already mentioned at page 33.

It results then, from this table, wherein we have avoided every kind of repetition, that out of seven hundred and twenty cases wherein the spurred rye has been administered, within our knowledge, during parturition, there have been—

In the first place, Six hundred cases of complete success; that is, where the foetus has been entirely expelled, living or dead, at the full term or otherwise; either twin cases or single; circumstances which we have not been able to specify in our table.

Secondly, Five successful cases of the delivery of the placenta or secundines.

Thirdly, Five successful in cases attended with uterine flooding after delivery.

Fourthly, Sixteen of moderately successful, which are made up of certain cases where the ergot has only excited for a certain time the expulsive pains; the deliverance being only accomplished naturally several hours after its employment: and secondly, of cases where, after having advanced the labour to that point where the application of instruments became admissible, it was at length accomplished by those means.

Fifthly, Eighty-two instances of complete failure, or cases wherein the ergot produced no evident effect; that is to say, induced no return of the uterine contractions, whatever might have been the doses in which it was given.

Sixthly, Twelve unfavourable or fatal results,

either in respect to the mother or the child; attributed by the several authors to its immediate action, or to some secondary effect of the ergot; and of the futility of which we have already given our opinion.

So that upon the whole it results, that out of seven hundred and twenty instances wherein the spurred rye has been employed, there have been six hundred and ten completely successful, not comprising those of moderate success, which we omitted; so that the chances of success are to the chances of failure in the proportion at least of seven and a half to one. Now then, as a similar result is but rarely furnished by any other of the therapeutic agents employed in cases of parturition, we may therefore conclude, that no other remedy can be compared with it, either as to its utility or efficacy in bringing on safe delivery.

Lastly, as to the proportions between the number of times that the spurred rye has been employed, and the fatal cases which are *attributed* to its use (results which would give only one unlucky case in sixty), this calculation is reduced absolutely to almost zero, considering all that has been already advanced in its favour.

CHAP. XVI.

RECAPITULATION.

FROM the preceding chapters then it appears, that the spurred rye or ergot, which chiefly shows itself in wet seasons, and is generally considered to be a diseased change in the common grain, is possessed of certain physical and chemical properties, differing entirely from those of the healthy rye.

2d, That this altered grain is the cause of various accidents, more or less severe, when it enters into the composition of bread, and is thereby taken in a certain quantity, and during a determined length of time.

3d, That this spurred rye has been employed for a length of time in cases of lingering parturition, unknown to medical men; and is endowed with this peculiar property, that when introduced into the stomach, or even the rectum, in doses of from twenty to sixty grains, it produces in a few minutes, by a stimulating or sympathetic action, strong and continued contractions of the uterus, followed by speedy and safe delivery, without producing any bad effects either upon the mother or child, provided always that this medicine be administered under suitable circumstances, and

only when the labour has been delayed or suspended in consequence of feebleness of the womb.

4th, and lastly, That in a few instances this medicine in some females produces no effect whatever.

We ought also to add, as a fact which is to be met with in the history of all new discoveries, that this remedy has been, and still is, from a variety of motives, the subject of numerous attacks which we have not attempted to conceal, but have, on the contrary, constantly pointed out; whence succeeding writers, guided by a new accession of facts, may either refute us or strengthen our conclusions, so that finally the effects of this remedy during parturition may cease to be any longer an object of controversy with the medical profession.

THE END.

CONTENTS.

	PAGE
CHAP. I. Origin of the Name	1
II. Natural History	2
III. Description and Physical Properties	9
IV. Chemical Analysis	11
V. Medical History.....	14
VI. Of the requisite Conditions for the successful Employment, in Cases of Parturition, of the Spurred Rye.....	24
VII. Circumstances in which the Spurred Rye ought not to be given at all, or at least with much caution and reserve	30
VIII. Preparations, Doses, and Methods of prescribing	37
IX. Effects of the Spurred Rye upon the Uterus, &c.	43
X. Mode in which the Spurred Rye acts	51
XI. On the Failures of Success of the Spurred Rye	59
XII. Harmless Qualities of the Spurred Rye when given medi- cinally—imaginary Accidents attributed to it.....	67
XIII. On the Use of Spurred Rye in various Maladies connected with the Uterus	79
XIV. Effects of the Ergot of Rye upon Animals.....	89
XV. Of the Employment of the Spurred Rye in Parturition— Recapitulation of the various Circumstances wherein this Substance has been employed	91
XVI. Recapitulation	104

WORKS JUST PUBLISHED

By **HORATIO PHILLIPS,**

3, CHARING CROSS.

I.

Price 3s. 6d.

THE STRANGER'S GUIDE THROUGH LONDON;

Containing a Correct Description of all Objects of Interest and Curiosity.

With a Map, Tables of Hackney Coach Fares, &c. &c.

II.

Price 3s. 6d.

THE VICES: a Poem, in Three Cantos.

By the AUTHOR of the LETTERS OF JUNIUS.

“ ——— And the deep fall
Of those too high aspiring.”

Paradise Lost, b. vi.

Now first published from the original manuscript, in the possession of the publisher.

III.

Price 7s.

CAMELEON SKETCHES.

By the AUTHOR of the PICTURESQUE PROMENADE ROUND DORKING.

IV.

Price 3s. 6d.

THE POLICY OF PRINCES: an Essay.

Containing, together with much useful Advice to legitimate Monarchs, a faithful Picture of the Present State of Europe.

By a MEMBER of the AUSTRIAN LEGATION.

V.

Second Edition, with Additions,

A PICTURESQUE PROMENADE ROUND DORKING, IN SURREY.

By JOHN TIMBS.

PRACTICAL OBSERVATIONS
ON THE
COLCHICUM AUTUMNALE,
AS A
GENERAL REMEDY OF GREAT POWER,
IN THE TREATMENT OF
INFLAMMATORY DISEASES,
BOTH ACUTE AND CHRONIC;
AND THEREFORE
AS A SUBSTITUTE FOR BLEEDING,
IN
DISORDERS WHICH ARE CONNECTED WITH INCREASED ACTION
OF
THE HEART AND ARTERIES.

BY
CHARLES THOMAS HADEN, ESQ.
SURGEON TO THE CHELSEA AND BROMPTON DISPENSARY; LATE
SURGEON TO THE DERBYSHIRE GENERAL HOSPITAL; MEMBER OF
THE MEDICO-CHIRURGICAL AND OTHER SOCIETIES, &c.

LONDON:
PRINTED FOR BURGESS AND HILL, MEDICAL BOOKSELLERS,
55, *Great Windmill Street, Haymarket*;
AND SOLD BY HODGES AND M'ARTHUR, DUBLIN, AND ADAM BLACK, EDINBURGH.

1820.

THIS LITTLE WORK

IS

DEDICATED

TO

THOMAS HADEN, ESQ.

WITH THE MOST

SINCERE FEELING OF GRATITUDE AND RESPECT,

BY HIS

AFFECTIONATE SON,

CHARLES T. HADEN.

62, Sloane Street,

November 15, 1820.

PREFACE.

THE *Colchicum Autumnale* has probably been used in medicine from a very early period, and in modern times at least, it has been celebrated for the cure of gout and rheumatism. In Germany also, it has been used successfully in some cases of dropsy; but never, as far as the writer is acquainted with the subject, in the form of powder, or as a remedy of great efficacy in controuling the action of the heart and arteries, and therefore, as a substitute for the lancet in the treatment of inflammatory diseases, and of those acute and chronic complaints, which are designated diseases of excitement.

In both these particulars, therefore, the writer claims for this pamphlet, the praise of containing something that is new and useful; but he begs to add, that, so far from feeling angry, if it should appear that other practitioners have entertained or published the same views, he will gladly receive such facts as a valuable proof, that the following pages most likely contain truth, instead of being the fruits of an immature deduction from insufficient data.

It has been deemed unnecessary to enter into the history of the *Colchicum Autumnale*, and of the new discovery, that the efficient part of the plant probably resides in a new alkali; or even to enlarge on the observations made by other practitioners on the subject; as this pamphlet is intended to contain no more than the result of individual experience. As such, it is offered to the fair criticism of the medical public; in the hope that they will not condemn the facts

which it contains, as exaggerated, until they have put them to the test of a cautious trial; and, that they will receive one portion of them, as resulting from the multiplied experience of an old practitioner, not unskilled to judge, and the other, as coming from a younger man indeed, but from one, who would not incur the responsibility of calling for implicit confidence, in a new remedy for the cure of acute and dangerous diseases, unless he had previously convinced himself, by reiterated trials, that he had not gone beyond the fair bounds of legitimate deduction.

Much fault will probably be found with the form of this pamphlet. The writer will be told, that he should not have expressed so much ignorance on the subject he has chosen for elucidation, and that he should have first produced an effect in favour of his remedy, by giving a detail of good cases, before he mentioned those in which it failed;

but he will say in reply, that he does not wish to produce "an effect;" and that, whilst he offers the remedy to the notice of the profession, only because, he thinks, he has been fortunate enough to acquire more information respecting it than is possessed by the generality of practitioners, he feels much more anxious to expose the hidden dangers of the medicine, than to make its advantages appear too prominent.

PRACTICAL OBSERVATIONS
ON THE UTILITY OF THE
COLCHICUM AUTUMNALE, &c.

WE are in some degree taking an erroneous view of the practice of medicine, if we are too solicitous about the discovery of new remedies; and this on two accounts. Firstly, because, if our diagnosis of a case be clear, that is, if we have been at the pains to learn for ourselves the exact part which is deranged, and the exact nature of the derangement which so affects that part, the proper treatment will, in most cases, suggest itself immediately: And, secondly, because it is probable that we already possess remedies which are capable of answering almost every indication, if we will only study them accurately, and determine for ourselves the precise action which each of them has on the constitution. Besides, it is useless to search for new means, if this be not done; for if we have not thus examined those medicines which are already in use, we shall probably be equally

negligent with regard to any new one which may be presented to our notice ; and therefore, to supply us with novelty in such a case, is only to pamper uselessly our own idleness.

This principle may be exemplified in another way. I intend in this essay to offer to the profession the *Colchicum Autumnale* as a most powerful means of subduing increased or irregular action, or what we call inflammation in the constitution ; and to shew its powers of lessening the necessity for employing more hurtful remedies, such as bleeding, in acute cases of disease : but in so doing, I know that practitioners who have thought for themselves, will tell me they can do the same thing by other means. When my friend Mr. Alcock publishes his promised work on the mucous membranes, he will shew, that very much more may be done in a similar way by the use of *Ipecacuanha* than is commonly supposed. I have understood that the best of the new school of Italian physicians use antimony and such sedatives as the Prussic Acid, with similar results.* Others employ profuse bleeding, and

* It seems that they quickly reduce the powers of the system by giving strong antimonial emetics in quick succession, and, as they call it, in the dry form ; that is, without assisting their

others purging, to answer the same purpose ; and thus it appears, that we may arrive at nearly the same point by following different paths ; which only proves that as none of these effects are produced by the direct operation of the medicines, study, and study only, will lead a practitioner to the skilful use of any assigned remedy.

The preceding observations have been made, partly because they are believed to be true, and partly to obviate, as far as is possible, the objection that is commonly made to those who propose a new remedy ; but, otherwise, the writer is so fully aware that new remedies are still a great desideratum, that he willingly joins the great authority of Lord Bacon in believing, that at some period or other, some great and signal addition will be made to our means of curing disease.

That we really are in want of new remedies is clear, from the fact, that although we succeed very well in curing moderately violent states of disease, yet deplorable cases but too frequently

operation by drinking warm fluids. I have repeatedly produced the same effect, by giving a quarter of a grain of tartarized antimony every quarter of an hour, gradually increasing the dose until sickness or the required relief follow.

happen, which mock our art, and set our best efforts at defiance. A great part of these difficulties however, may arise, from our ignorance of the true pathology of many important diseases; yet still, though we may know so little respecting the real nature of inflammation and of febrile action, it is equally clear, that, at present, we are not perhaps possessed of any remedy, that acts otherwise than indirectly in the cure of these states of disease.

Our most powerful remedy bleeding stands pre-eminently in this predicament; for, although in some few cases, it appears to be an object to lessen *the quantity* of blood, yet the same thing cannot possibly be supposed to occur in the more common cases for which we bleed; as when we take away in a very short period several pounds of blood for the cure of an acute disease: for we can scarcely do this for the mere purpose of lessening the quantity, when the patient, perhaps, a few hours before, was or appeared to be in perfect health. We bleed in such a case, only because, by thus suddenly lessening the powers of the constitution, we subdue in the quickest way at present known, that ebullition of the system which appears to form such an essential part of inflammatory diseases.

Whatever may be the true pathology of inflammation, however, whether or not it be in its essence an affection of the nerves, or whether or not the capillary arteries be in a state of diminished action from debility and congestion, as Dr. Wilson Philip supposes, it is enough for us to know, that the heart and arteries are thrown into a state of inordinate action, and that our means of cure almost entirely reside in the power which our remedies possess of subduing this inordinate action.

Reasoning in this way, it is fair to infer, that some great remedy for the cure of inflammation will be discovered in that class of agents which we call sedatives. None of the sedatives at present known however, are much celebrated for their power of curing inflammation: digitalis, in some hands, is often very effectual; but, either from some peculiarity of the medicine itself, or from our want of knowledge of the best means of managing it, its powers are depended upon but by very few persons. The prussic acid seems perhaps to possess as much efficacy in this way, as any of the class; but it has hitherto been but little investigated.

We can scarcely class the Colchicum with the sedatives abovementioned; for though its

effects on the constitution be eminently sedative, yet, as it also possesses the power of materially increasing the secretions, it is not yet clear how much of its lowering power depends on these tangible effects, and how much on its direct sedative properties.

Certain it is, however, that in the author's practice it has proved a remedy of eminent power, in controuling the action of the heart and arteries; and in curing those states of the constitution which we are taught to name diseases of excitement, and as such it is offered to the notice of the profession.

In offering these observations on the use of Colchicum I have two duties to perform; the one to give the result of my own experience; the other to do justice to the claims of another. My father, who has practised for nearly forty years in Derby, began the use of Colchicum in gout some years ago; at the time Mr. Want published his first paper on the subject. At this period he gave from a drachm to a drachm and a half of Mr. Want's tincture, without further mixture, in cases of gout; but finding that forty-eight hours frequently elapsed before the purgative operation of the medicine was produced, and as that operation also was often

violent, especially when a repetition of the first dose was required, he began to give the common purging mixture with the Colchicum. Under this mode of exhibition he found the beneficial effects of the Colchicum to follow more quickly, and to be equally decided as when the purging was produced by Colchicum alone. He then extended the use of the remedy from gout to rheumatism, and from the latter to the treatment of cases of inflammation in general; but finding that violent effects sometimes arose from the use of the tincture, he tried the remedy in the form of powder, and as it appeared that it was more manageable in this form, and was, at the same time quite as certain in its operation, he continued to use it almost exclusively, and has now, for more than six years, employed a combination of powdered Colchicum and opening medicine as his common prescription in all diseases of excitement.

From this account, it is apparent, that his experience in the use of Colchicum has been very extensive; and I shall give the general results of that experience nearly in his own words, as his expressions are frequently very strong, and, if verified by other practitioners, are very important.

In the pure inflammations he says, “ If it be given every four hours, until it produce an abundant purgative effect, the pulse will become nearly natural, from being either quick and hard, or slow and full. This frequently happens even before purging has taken place ; and the effect is so certain, that I never bleed, unless inflammation exists to an alarming degree in a vital part, and then never more than once.

“ Fevers and inflammations so removed, never require the use of tonic medicines during convalescence ; the patients indeed generally appear to be as well as though they had not been at all the subject of disease ; and although it sometimes happens that a recurrence of symptoms takes place, it is in a much milder degree, and the new disorder is always immediately removed in a few hours, by a very little of the same treatment.”

The above quotation comprehends nearly the whole of his written sentiments respecting the use of Colchicum in acute diseases ; but I have frequently heard him express, in conversation, the results of his practice in individual disorders ; and refer to cases of violent acute disease of almost every kind, in which the symptoms gave way in the most rapid manner ; cases

where, from his having been called in early, a disease which would not, under the usual treatment by bleeding and purging, have been cured in less than a week or a fortnight, and would have then left the patient in a state of weakness, has been removed by the use of Colchicum in two days, and the patient left really in a state of health

Amongst these he has mentioned rheumatic inflammatory fevers, inflammations of the lungs or membranes, catarrhs and influenza; but, perhaps especially, such cases of fever attending the puerperal state as he calls puerperal fever. In these last cases, I heard him say this morning (September 17th, 1820), that the Colchicum acted like magic.

It is unfortunate that no record remain of these cases; but, amongst others of very recent date, he related the circumstances of two, which as the first exemplifies the most favorable mode of the action of Colchicum in acute cases, when given early in the disease, and the second its action in similar cases where the disease is more advanced, I shall give them; especially as a reference to the book, in which the medicines were ordered, has convinced me, that the details do not materially differ from the true circumstances of each case.

Case of Acute Rheumatism.

A stout athletic labourer was suddenly seized by rigor, after working several hours in the River Derwent. Violent fever followed; and on the next day, he was confined to his bed, being incapable of moving his limbs in the slightest degree. Five grains of the powdered Colchicum with a scruple of the sulphat of potash, were given four times in the day; and on the day but one after, he was met walking in the street, and was very soon quite well. Five doses of the medicine were taken.

Case of Bronchial Inflammation, in which the disease had continued for several days, and was complicated with pleurisy.

A lady, 60 years of age, light complexioned, and of rather delicate health, was visited for urgent symptoms of inflammation of the cavity of the chest, which had existed, in a less acute form, for more than a fortnight.

She was at that time, however, laboring under symptoms of fever, attended by restlessness, a very hot skin, a strong full pulse of 90 in the minute, great difficulty of breathing, pain in the side, an incessant cough, and a copious expectoration of tenacious mucus, which was so equally tinged by blood, as to

have acquired a regular mahogany colour, and to appear, as my father expressed it, as if the blood had exuded from the vessels of the inflamed membrane, at the instant of the mucus being secreted by them.

These symptoms were so urgent that she earnestly requested to be bled. The Colchicum however was given in the dose of three grains four times a day, with a scruple of the sulphat of pot-ash. On the second day the symptoms were still urgent; but on the third, copious purging took place, and the most material relief followed: indeed except that the expectoration and cough continued, the symptoms had nearly subsided. The form of the disease was thus entirely broken, but as the cough was teasing, one sixth of a grain of emetic tartar, and the same quantity of opium was given, with ten grains of chalk, four times in the day, instead of the Colchicum. Fourth day: some increase of symptoms was present, and the pain in the side more urgent; five grains of calomel and six of Colchicum were therefore given in pills at bedtime, and the powders were repeated. Fifth day: the breathing was relieved, and the expectoration was much easier; but, as pain still continued in the side, a blister was applied, and

12 USE IN CHRONIC AND SUB-ACUTE INFLAMMATION.

the powders were repeated. Sixth day : some return of the symptoms required a repetition of the calomel and colchicum. Seventh day : savin ointment was ordered for the blister. On this day the spitting was recollected to be quite colourless. Eighth day : the pain was gone, and the patient craved much for food. Tenth day : she had no complaint, except an asthmatic kind of breathing, for which pills of emetic tartar, gum ammoniac and myrrh were ordered ; under the use of which, she gradually recovered, except that, for some time she was unable to take stimulating food without quickening her pulse, increasing her asthmatic symptoms and inducing a more copious expectoration of transparent jelly-like fluid.

With regard to chronic and less acute complaints, my father says, in his written communication—" In organic derangements of structure, when occasionally attended by inflammatory symptoms, the above treatment answers perfectly in curing the super-induced inflammation ; so much so, that at times the general actions are so much subdued as to give no notice, by symptoms, of the existence of the primary disease ; thus, in one case, gangrene was going on in the foot, whilst the

inflammation, which produced it, was subsiding under the use of Colchicum. In chronic rheumatism, six grains, with one drachm of sulphat of pot-ash, taken every morning, will, I believe, always answer. In some cases, however, many weeks elapse, before the patient is well; although, when patients have persevered, I have not known it to fail. In habitual discharges of blood from plethora, when under the ordinary treatment, frequent bleedings were required, the daily use of Colchicum (as above) has answered very well indeed, as far as I have been able to try it. It has great influence in consumptions, but it does not remove the complaint. After accidents, its effects are sometimes extraordinary, if immediately given; it seems to have the power of averting the severe consequences which usually follow such cases."

Some general observations follow on the management of the medicine which we shall transcribe. "In all acute cases, great attention is required, to ascertain the proper dose. If relief be not apparent in twelve or fifteen hours, the dose must be increased, and calomel or the black dose be given in addition, so as to bring on the purging sooner.

It is necessary to continue the Colchicum

for some time after the purging has been produced, if the least disposition to inflammation, or the inflammatory diathesis, remain.

Its effects are so certain that a long case with me is quite a rarity and only occurs when the patient is not seen early in the disease; and seldom then."

This last sentence is further verified by a remark which we have heard him make, and in which our experience fully agrees; that the medical practitioner is frequently robbed of his fair meed of praise by the use of Colchicum in acute complaints; for the disease is often so speedily cured, that the patient is not aware that he has laboured under an illness, which would in the ordinary course of things have required active depletion for many weeks, and the ultimate result of which might have been, for some time doubtful.

I shall be excused, (for how many men treat their horses better than themselves) if I insert here a case, which is interesting, because it shows the peculiar mode of operation of this medicine, as well as those above related, and that it is applicable to the acute diseases of horses as well as to those of the human subject. It shows also, the deleterious effects of the remedy when given in an over dose.

Case of Inflammatory Fever in a Horse.

In August 1820, a horse of my father's went a journey of 500 miles. He was occasionally unwell at the latter part of the journey, but was not laid up, until he had been ailing for a week in the early part of September. At this time his breathing was considerably affected, and rattled; also, if he drank cold water, he was affected by shivering. The skin after this became hot, and the nostrils very red and much inflamed; but his ears, shewed that the skin was occasionally cold as well as hot. He had a hard, but not a frequent cough. Warm mashes were given to him, but no medicine. His legs and joints generally became stiff and very much swelled, and his difficulty of breathing increased, until it appeared necessary to take away three quarts of blood. This evacuation afforded him much relief, and the blood was singularly inflamed; above one half of the quantity consisted of the buffy coat, and there was no separable serum. Colchicum was now given to him in the dose of two drachms every six hours with an ounce of salts.

On the next day, September 15, more attention was paid to the horse's symptoms. His joints were still as much swelled and as stiff as

before, his skin though not so hot, was still hotter than is natural, and his breathing was still unnatural. If the Colchicum had not been given he would have been then bled again, but we agreed to defer bleeding him till next morning, and the medicine alone was continued. On the 16th purging began to take place, and his symptoms were nearly gone; his joints had almost acquired their natural size, the skin was cool, and the horse was more lively. His pulse was now much more perceptible than on the 15th, and beat forty-two times in each minute. The Colchicum was discontinued, but in the course of the day it was found that the dose of the medicine had been too large; for he was much purged and apparently greatly exhausted, he had occasional severe attacks of pain in his bowels, and was so ill, as greatly to alarm the servant for his present safety. Laudanum ℥ss. and compound tincture of gentian ℥ij. were given, and on the next day he was perfectly in a state of convalescence; the excitement having entirely subsided, and the swelling of his joints being completely removed.

In this case, the good effect of the Colchicum was as decided, as in similar cases in the human subject. The dose however was too

large, and perhaps an error was committed in not adding spice to it; for it seems that spice is always added to opening medicine, when given to horses, on account of their being liable to suffer, and even to die, from attacks of colic. He took six doses of the medicine.

It only remains to show my father's mode of prescribing Colchicum.

In acute cases, he gives from two to eight grains of the powder, with a scruple or more of sulphat of pot-ash, in rose mixture, every four or six hours, increasing the dose after a few hours, until either purging is produced on the second day or third day, or the common black dose, or calomel, is given in addition. The medicine is now laid aside, if its effect on the disease be decided, or it is given in diminished doses, or one dose of six or more grains is given occasionally, with calomel at night.

In chronic cases, one considerable dose of five grains and upwards is given every morning early, with a drachm of sulphat of pot-ash, in a tumbler nearly full of warm water. In this form, it is continued for weeks together, other opening medicines, such as jalap, being added to it, as occasion may require.

I shall now add to the above statement, an

18 COLCHICUM OFTEN, UNEXPECTEDLY, MAKES
BLEEDING UNNECESSARY.

account of the use of Colchicum in my own practice.

I have used it extensively for the last three years, and principally in conjunction with sulphat of pot-ash, as recommended by my father. On the whole, the result of my experience does not vary from that of his; I find it to be a most material auxiliary to the lancet in inflammatory diseases, even in the very acute cases, whilst in the usual forms of inflammatory fevers, it supercedes its use in almost all cases. In pneumonia, for instance, the following circumstance has repeatedly happened. Cases have occurred, in which it has been thought prudent to recommend bleeding at the first visit; but where the patient has requested to postpone the operation till the next day, by which time so much relief has been obtained, that the bleeding has been totally unnecessary: one of these patients I recollect was a lady far advanced in pregnancy; and to her, the result was peculiarly gratifying. The same observation may be made with regard to almost all the other forms of acute diseases. It is necessary to say, however, that I have not been so decidedly successful in my employment of Colchicum as my father has been;

but I know that part of that has arisen from my not understanding its use so well as he does.* In many cases it has been unsuccessful; and I have not yet been able to discriminate those forms of disease in which it succeeds, from those in which it fails. Two cases of pneumonia occurred on the same day, and they appeared to be of an equally acute character. One of them was relieved in twenty-four hours and was soon well; the other required bleeding on the second day, and the Colchicum did not succeed until considerable depletion by the lancet had been premised.† Even in acute rheumatism a previous bleeding is often required. In one case of a stout female servant, after calomel and antimony had been prescribed,

* Increased attention to the powers of the remedy since the early part of this essay was written, as also an opportunity of learning the peculiarities of my father's practice from his own mouth, have produced cases which will be detailed below, and which perhaps equal the best of those which he refers to; and indeed they are such as would lead me to say, that my knowledge of the extent to which the beneficial effect of Colchicum may be carried is still very limited.

† With respect to this unsuccessful case, I think I dare now state, that had I materially increased the dose of Colchicum instead of bleeding, the disease would have been sooner cured, than it was by the lancet, and the smaller doses of Colchicum conjoined.

ten grains of the powder, repeated four times in the day, with enough opening medicine to secure a full action of the bowels, did not relieve the symptoms ; so that on the fifth day, a full bleeding was required. After that, the Colchicum acted most decidedly ;* and in one respect very peculiarly, as it illustrated an observation made by my father, that it sometimes masks the existence of local inflammation. The patient appeared to be in a state of almost perfect health. Her pulse was under seventy, and natural, the pain was entirely gone, her skin was perhaps cooler than in health, and her constitution appeared to be even in a state of languor and debility. But *as her tongue was not clean*, the use of invigorating diet and medicine was refrained from for more than a week ; when her inclinations were indulged by allowing animal broth, and giving half a scruple of cinchona twice a day with Colchicum. Her pain returned almost immediately ; and then a repetition of the Colchicum and the inducing of decided purging, cured all the symptoms and cleaned the tongue ; after which, the patient was *really* well. This was one of the cases

* The last note is perhaps equally applicable to this case as to the one above, or rather, I should now say, that too much opening medicine was given with the Colchicum.

which confirmed me in my dependance on the state of the tongue as an index of the progress and form of diseases. It very seldom happens that the appearance of the tongue is deceitful, and I have long been intent on making accurate observations on the state of the tongue in diseases of the different structures of the body ; in the hope of tracing that primitive appearance of its surface, which, it is evident, belongs to each of the simple uncombined inflammations and irritations of the various tissues.

In the fevers of children, in which Colchicum generally succeeds, opening medicine is often an indispensable requisite in the prescription. To one little girl, Colchicum was given for several days, and even with enough sulphat of pot-ash to act fairly on the bowels, but the feverish symptoms only remitted, they did not entirely go away ; whilst on the exhibition of a decided purgative, a load of fæces was discharged, and the patient was almost immediately afterwards well.

In many cases of acute rheumatism, and the same observation may be said of all other diseases, it has seemed as if great attention to other means of cure, as well as Colchicum and purg-

ing, has tended materially to hasten the termination of the complaint.

Two Cases of Lumbago.

Two patients, of about the same age, lay in their beds unable to stir from lumbago. One of them, a gentleman, in addition to taking Colchicum, paid attention to the usual general requisites of good treatment, drank plentifully of warm fluids, and eat nothing, went into the warm bath twice a day, and kept himself covered by the bed-clothes. He was consequently quite free from pain in twenty-four hours, and was up and well in four days; whilst the other, a lady, although she lay in bed, and her disease left her perfectly well in a week, yet she did not use the warm bath, nor did she drink plentifully of warm fluids, nor was she attentive to keeping her skin in a damp state, and her pains only gradually receded. In neither of these patients was the use of tonics required; although in the previous acute attacks from which the lady had suffered, she had always lost much blood, and her convalescence was extremely slow.

The following is the written report of the last case as made at the time.

Case of Lumbago treated by Colchicum.

Mrs. B. aged 40, thin, and liable to inflammatory complaint, was gradually attacked by lumbago, so that in three or four days, on August 12th, 1819, she was unable to move in her bed. She was not then particularly hot, but her pulse was 100, and hard.

She took of powdered colchicum gr. vij. and of sulphat of potash ʒi. every five hours.

2d. day—Was somewhat better; the pain being still nearly as bad as before. Add a drachm of sulphat of magnesia to each draught, as the medicine has not acted on the bowels: also take of calomel gr. iij. and of antimonial powder gr. vi. at bed-time.

3d. day—Had been purged and sweated much in the night, and was much easier; but the pain had remitted before the purging or sweating occurred. Continue.

4th day—Still better. Continue.

5th day—Was quite easy, but had been sick; had passed several dark and bilious stools, and felt exceedingly low and uncomfortable. Take volatile saline draught.

6th day—Still depressed, but up and free from pain. Was very weak. Take no medicine.

7th day—Much better, but still weak.

8th day—The patient was nearly in her usual health.

The following case is given here as it was, in some degree, a failure in the administration of the medicine, and is otherwise very instructive. The notes are copied as they were made at the time. The case is hinted at for another purpose in page 19.

Case of Acute Rheumatism.

Mr. S——'s servant Jane, aged 40, was attacked by acute rheumatism on Monday, July 12, 1819.

2d day—Was lying in bed unable to move either of her legs; both of them being swelled, and red in patches over the joints. Gave calomel and opium at night, followed by salts and senna on the day after.

3d day—No better. Gave of powdered colchicum gr. x. of sulphat of potash \mathfrak{z} i. and of carbonate of potash \mathfrak{z} i. once every six hours.

5th day—The powders purged, but did not produce much relief. Prescribed them without the sal polychrest.

6th day—Much as before.

9th day—Had not taken the powders regu-

larly on account of their still purging violently. To-day, the pain and swelling left the legs and fell on the arms. V. S. ad. $\frac{3}{4}$ xvi.; ordered of colchicum gr. x. of Dover's powder gr. iij. and of calomel gr. ifs. three times a day.

10th day—Much better; pain less, but the wrists and hands are still swelled and inflamed. Continue the powders.

15th day—For three days has had neither pain nor fever; the swellings are gone, the skin is cool, and the pulse is 64, and soft. Complains only of weakness. Has had four motions since yesterday. R. colchici gr. vi. calom. gr. i. pulv. Dover's gr. iij. pulv. cinchonæ ðss, ft. pulv. ter die sumend. Let her have broth.

17th day—Was hotter, and had had more pain. Let her take the powders as prescribed on the 9th day. From this time she slowly recovered.

In this case the Colchicum was at first trusted to improperly. It was insufficient to subdue the inflammation until V. S. was employed; when it answered every purpose, and the patient was, before the bark was given, quite well; except that the tongue was furred. This furred tongue was improperly slighted; only, however, because it seemed to be unsupported by any

26 CASE OF ACUTE RHEUMATISM, IN WHICH PRUSSIC

other symptom of the smallest importance. Nothing can show the controuling effect of *Colchicum* so strongly as this. With what other medicine would the constitution have appeared so quiet under the circumstance of such a tongue? Omitting the bark speedily cured the patient.

The following case describes also a failure in the use of *Colchicum*; but, perhaps neither that case, nor the one before it, would have run the same course, had they occurred within the last few months. The Prussic Acid appeared to be of signal service in the last case.

Case of Acute Rheumatism. Action of Colchicum and Prussic Acid.

September 18, 1819, Mr. Walton, aged 26, applied. Disease, Acute Rheumatism of the congestive character. V. S. and *Colchicum* in the ordinary dose, every six hours.

26th—Had taken the powders with tolerable regularity. After the bleeding, the excitement was fully developed; but the *Colchicum* so masked the symptoms, as to prevent a repetition of the bleeding, which would have been of advantage, as it now appears. He was relieved, however, in some degree, especially when the

medicine brought away, which it did daily, in large quantities, much very foul, dark, lumpy fæces ; but still his heat and perspiration were very great occasionally.

27th—The pain, after attacking on the preceding days, various of the joints, shifted to the chest, especially on the right side : he was also in much general pain, and passed sleepless nights. Emp. Lyttæ. calom. gr. i. opii. gr. $\frac{1}{4}$, pulv. antim. gr. ij. 6th horis.

28th—Was easier, and slept much better. Difficulty of breathing and pain gone.

29th, 30th, Oct. 1st. & 2d—Continued the medicine ; but, for two days, in half the quantity, from his mouth being sore. On this day he was very ill ; in constant pain, very hot and covered with perspiration. He could not move, and had not slept for two nights. R acid. prussic. gutt. x. aquæ distillat. 3vi. cap. coch. larg. 2^{dis} horis.

3d—Had slept five hours during the night ; was very easy, could walk, and said he was getting quite strong ; but the pain in the chest had returned on the left side, and it became worse in the evening. Emp. Lyttæ. Had taken nearly all the mixture. Continue.

This man got a letter for St. George's Hos-

pital, but was only made an out-patient, the house being full. In a fortnight, going out into the air had increased his complaints, until he was almost as bad as ever; skin hot, great pain, much restlessness, much cough, and a feeling as if he was consumptive. Resumed his prussic acid. Next day was much better. Continued.

Oct. 21—Was quite well. Had got gradually better since last report.

Fatal Case of Bronchitis.

An old man died yesterday whilst taking Colchicum; but, in his case, it had frequently saved him from death on other occasions, and it even alleviated in some degree his last fatal attack. He was a pursy old man, who had not lain down in his bed for ten years, on account of an asthmatic affection. He frequently suffered from inflammatory attacks, and on the present occasion, he had been ill a week; a considerable loss of very buffy blood retarded his death in the first instance, but his lips became livid, the expectoration became abundant, and difficult of expulsion, and he died with his bronchia filled with mucus. In such a case, of course, it could not be expected that Colchicum

should save life ; and it will probably fail in the same way, in those very acute inflammations, which destroy life so rapidly, even when bleeding is pushed to extremity.

It appears to disagree with some constitutions ; but I have not myself met with such examples. My father however mentions a few patients, in whom languor and sickness are immediately produced ; and another of my friends reports, that he has been requested by one or two of his patients to leave off “ that very unpleasant medicine.”

I shall now relate a few examples of its beneficial operation in acute disorders,

Case of Pneumonia in a Child.

A child had been two days ill of pneumonia. Colchicum was exhibited instead of the lancet, and on the third day his recovery was so perfect, that an eminent physician, who was visiting another patient in the house, on being asked, said that the child had no disease, and was much surprised to learn the true state of the case.

*Case of Febrile Excitement occurring in
Pregnancy.*

A lady had been bled without much relief for that state of feverish restlessness which oftens affects persons during the latter months of pregnancy. Perfect relief followed the use of Colchicum in the ordinary dose and form, after three days' exhibition; and as she more than once reproduced the same symptoms, by taking more food than was proper, it acted in each case as beneficially as on the first occasion. Indeed, it seems to be peculiarly adapted for the relief of this very common state, in which pregnant women are found; and too much care cannot be taken to remove such symptoms; for observant practitioners have found fatal cases of puerperal fever after delivery, to be connected with their previous existence.*

* The recollection of one very gratifying case of this kind occurs. A lady, whose particular friend had died from a deplorable attack of puerperal fever, in spite of the very best treatment, fell into this state of febrile excitement; and as it was recollected that her friend had been similarly affected before her confinement, she felt certain that she herself should also die of puerperal fever after delivery. Her skin was very hot and flushed, her pulse was strong and hard, and she was so restless as well as hot during the night, that she generally walked about the greater part of the night, and of course got but very little sleep.

Case of Inflamed Breasts and Nipples.

In another case, connected with the state of parturition, the efficacy of Colchicum was very agreeably marked. A lady was unable to suckle her first child on account of her nipples being so exceedingly tender. Abscess occurred in one breast, and many months elapsed before she recovered her health. On the fourth day after the birth of her second child, the same symptoms were present. It was torture to let the child touch her; her skin was hot and her pulse strong; the nipples projected, they were covered by fluid secretion, and were of a dark brown-red colour, and the breasts were loaded by milk. She had been amply purged. Bleeding was first adopted, and then the Colchicum was prescribed, to be taken four times a day, with opening medicine. On the third day, the patient's constitution was in a state of perfect tranquillity; the pain was no longer present; the child sucked very well through a shield; the breasts were moderately distended, and the nipples were very remarkably altered in their appearance. The swelling, the red-

Bleeding, and afterwards abstinence and daily laxatives, continued for about three weeks, dissipated all the symptoms, and she soon after passed through her confinement with very little pain and without illness.

ness, and the fluid secretion were gone, the nipples were scarcely able to support their own weight, and were entirely free from any angry appearance.

The treatment of this case commenced on September 11th, 1820, and it is but right to say that I had never seen inflammation of the nipples yield to any treatment so perfectly, where the child continued to suck, as in this instance.

The lady continued well until October 8th, when she again applied on account of a recurrence of the symptoms. Calomel and saline medicines were prescribed; but on the second day she was much worse, both as to her symptoms of general fever, and the inflamed state of her breasts and nipples. She was much alarmed; for she was certain from her sensations, that the breast would again gather; especially, as that breast in particular, was very hard, and discharged blood only instead of milk, when it was drawn; which operation was not performed but with excruciating pain.

The same dose of Colchicum and of sulphat of pot-ash was now given four times a day, the bleeding was not repeated, and a cold lotion was applied to the breast.

3d day—She was better in health ; but the breast was red externally, as if suppuration would take place. This produced some regret that the bleeding had not been premised, as in the first instance. The patient was much purged by the medicine, as on the former occasion.

4th day—She was nearly well ; the nipples were perfectly free from pain ; both the breasts were quite soft ; her fever was gone ; and, as she now gave up suckling, one of the draughts taken daily, for four days, left her quite well.*

Case of Acute Rheumatism.

In a gentleman, who was lying in bed, nearly unable to stir, from acute rheumatism, with a strong pulse, a very hot skin, and his face covered by an oily perspiration, the complaint was so entirely removed on the third day, that the patient was up, and did not require the further use of medicine.

My brother, who is surgeon to the Derbyshire General Infirmary, furnishes me with the following case:—

* This case goes far to teach us that our practice in inflammation of the nipples would be more successful, if we treated it more as if it were connected with a constitutional cause.

Case of Acute Rheumatism, in which a more rapid cure took place than is usual.

Mrs. Hudson, an emaciated old woman, who had suffered much from being reduced in her circumstances, became ill from a severe attack of rheumatic fever.

She was treated improperly for three weeks; the fever having been so violent, during that time, as to reduce her apparently to the last extremity.

She was seen, for the first time, under these circumstances; and it was found, in addition, that she was unable to move herself from the position in which she lay: that her pulse was quick and feeble, her fever violent, and that she screamed out at every attempt at motion. One drachm and a half of the Tincture of Colchicum was given at bed-time, with infusion of roses.

On calling, the next day, my brother says, "I was told she was coming down stairs; and she really did hobble down, a mere ghost; but she was free from pain, her pulse was ninety, and she complained of nothing but extreme debility."

"On further enquiry, she told me, that the draught seemed to warm her stomach, and that she speedily fell asleep, and slept till morning."

“At that time the medicine had neither purged her, nor produced sickness, nor indeed any other sensible effect on the secretions; but some purging occurred in the evening, and she took no other medicine, but in a few days was following her employment of selling milk from door to door.”

My brother said also, that he had seen the same rapid cure take place in cases of gout.

For a reason which is mentioned afterwards, I have not hitherto trusted to the single use of Colchicum, in what we call Idiopathic fevers: but in the following case, it cured the complaint, and acted the part of an opiate, after calomel and common purging medicine only gradually and imperfectly relieved the symptoms. The Colchicum, however, was pushed rather too far.

Case of Simple Fever treated by Colchicum.

Mr. Coates, aged 35, and weak, applied, with symptoms of common fever, on Sept. 28, 1819. Had had it for some days. The excitement was not fully developed, and the chief symptom was head-ache, which was rather severe.—Ordered calomel and antimony, followed by black dose. Tongue was covered with

a dull, dirty, brownish-grey, but smooth, slimy coat.—29. Was somewhat easier; had been purged.—Rep. pil. et haust.—30. Head not much better, tongue beginning to clean at the edges: had been purged.—Colchicum et sal polychrest. ter die. October 1. Much better; was tranquillized in a very remarkable manner. Tongue much cleaner at the edges; great sweating produced; had been purged. Continue.—2d. Still better. Continue.—3d. Not quite so well, the medicine beginning to disagree; it had created sickness and general uncomfortable feelings. Sweating and purging continued; stool dark, and in pieces; tongue with a small quantity of the dirty appearance in the centre, but the clean edges becoming covered with a thin white scurf, certainly from irritation on account of the over-dose of Colchicum.

This patient, from this time, required small doses of opening medicine for some days; when he was able to resume his common occupations.

The use of Colchicum in Sub-acute and Chronic Complaints.

In sub-acute and chronic cases, very many instances of it's remarkably beneficial operation occur to my recollection.

Case of Porrigo Favosa.

A very unhealthy child, of six months old, had been, from birth, in frequent hazard of dying in consequence of an irritability of constitution, which was connected with a very diseased state of scalp, from porrigo favosa. This child was under very skilful management, but no plan appeared to relieve the irritated state of his habit. Fever was constantly present; an acrid secretion poured from the surface of the scalp, and symptoms of cerebral irritation occasionally ran so high as to threaten attacks of inflammation of the brain. Local applications, as well as general remedies, were also tried in very great variety. It was at last requested that the Colchicum might be given; and the relief was so remarkable, that the attendant practitioner expressed his surprise in strong terms. I am unacquainted with the ultimate result of the case.

On the same principle, the cutaneous diseases, which so abound amongst the patients who apply for relief at the Chelsea and Brompton Dispensary, are more benefited by the use of Colchicum than by any other remedy. In many cases, the angry appearance of the skin subsides, the pustular or scaly eruptions cease

to discharge, and are thus speedily healed, either with or without the assistance of local applications.

It is not, however, equally successful in the dry form of psoriasis. It succeeds in some ; but in others, where the constitution seems to take but little part in the disease, it has apparently but little effect.

Case of Psoriasis.

In one case of moist psoriasis, which was cured by purging and low diet, an obstinate state of feverish irritation remained, which was not at all relieved by severe purging and collateral modes of treatment. It entirely subsided after three days' use of Colchicum.

In the treatment of ulcers, many cases have occurred, in which, a most material alteration has been made in the appearance of the sore during the first week, by checking the irritable state of the part and of the constitution, by the exhibition of Colchicum.

Local phlegmons also, erysipelas, ophthalmia, and such inflamed states of particular parts, as are kept up, or are accompanied by an excited state of the system, are in an equal degree benefited by the same remedy.

After having related so many, and such decisive cases as the above, it is perhaps unnecessary to give more instances of the good or bad effects of Colchicum in the treatment of disease: but, as the author is anxious, on the one hand, to avoid misleading his readers, by relating only picked cases, and thus giving an erroneous account of the real facts of the case; and on the other hand, to save himself from suspicion of having given a false colouring to his statements, by resorting only to extraordinary instances of success; he has given below a short account of every case in which he prescribed Colchicum, during a certain period; and, to make that period the more unexceptionable, he has chosen the time between October 10th, 1820, the day on which he returned to London, after a month's absence, and the present day, October 26th; and he will give the whole in the form of a diary, accounting for each case as he goes on.

October 10th.

Mrs. L.—Case of inflamed breasts and inflamed nipples. This case is related above, in page 31.

Miss T.—Case of acute bronchitis, supposed to be consumption. As this case is one of the

most satisfactory illustrations of the efficacy of Colchicum, in similar diseases, it shall be given in detail, as taken at the time.

Case of Bronchitis and threatened Phthisis treated by Colchicum.

Miss T., aged 12, had suffered from a hard, teasing cough for many weeks, when it increased considerably; great irritation of the larynx, and considerable fever came on. These symptoms were not treated very decidedly, so that at the end of a fortnight, on October 10th, 1820, her pulse was found to have risen to 130 in the minute, and was hard; her cough was dry and constant; she could not fill her chest with air, her skin was very hot, and her face was flushed.

Under these circumstances, as she had from childhood been of a weakly habit, and was troubled by enlarged glands in the neck, her case was considered to be very dangerous; inasmuch as it was feared, that phthisis had already made considerable advances in her constitution. Four grains of Colchicum powder, and two scruples of sulphat of potash, were given four times in the twenty-four hours, and the assistance of a physician was requested. On the next day and the

day following, no material change took place. The medicine, however, by favor of the physician, was continued; and as the bowels had not been moved, three grains of calomel and two of aloes were given, in addition, at bedtime. It may be necessary here, to state, that the disease might have hitherto been in some degree kept up, by the patient having indulged her appetite more largely with the vegetable food that was allowed than was proper.

On the 4th day, a great change had taken place; the bowels had acted copiously, and all the symptoms were relieved; so that on the 5th day her pulse was reduced to 80, and on the 6th, to 72 beats in a minute;—the bowels having acted fully every day. She had been in bed for the four preceding days, but was now permitted to sit up for a few hours in the afternoon; only half the quantity of Colchicum was now given, and in two days after, it was left off altogether.

October 26.—This young lady has continued to improve. Her tongue is quite clean, and has been so, since the full operation of the Colchicum; her cough is very nearly gone, and she feels quite well; but on account of the delicacy of her constitution, and the other cir-

cumstances of the case, it is determined that she shall keep wholly in a warm atmosphere during the next winter.

It is right to state, that the physician's fears of consumption being far advanced, were, in the first instance, equally strong with those of the writer, or perhaps stronger.

Mrs. E., aged 30, was suffering from a common catarrh. She took six five-grain doses, and a small quantity of common opening medicine, in the morning, for a few days; after which, she took a bitter opening draught daily, on account of an old stomach affection, but was otherwise well.

October 11th.

Mrs. L., aged 55, a corpulent person, who had suffered for some time from a slight degree of general feverishness, attended by heat at the stomach, and an itching eruption on the skin, similar to urticaria. A slight mercurial, with ipecacuanha, was ordered for bed-time, and five grains of Colchicum, with a drachm of sulphat of potash, in warm water, for the morning. A restricted diet was also recommended.

26th.—She has continued to take the medicine, and is now nearly well.

October 12th.

Mr. P.—An old case of deranged digestive organs, with a white, furred tongue, some heat of the skin, and considerable itching when warm in bed. Seven grains, with sal polychrest, were ordered to be taken every morning, October 26. He was better, but far from recovered: he had, however, not taken his medicine very regularly.

Mrs. B., aged 45, had been under the care of various medical men, for a general feverish state of the constitution as marked by white and dry tongue, hot skin, constant pain of the head and limbs, and very deranged alvine secretions. She had first been prescribed for by the Author, three months before, when the daily use of Colchicum, as in other sub-acute cases, continued for some weeks, had more effect in removing the symptoms, than had resulted from any previous mode of treatment. She had now, Oct. 12th, some increase of her complaint, and has since then continued to take the medicine, with the same effect as before. As an index to the state of her habit, it may be said that she had been burnt formerly on the shoulder, by an unskilful cupper;

and the part had from that time existed in the form of a large, red, injected wheal, which was very painful. The size and inflamed state of this part, was also much reduced by the use of Colchicum; after which pressure was applied with success.

October 13.

Mrs. S.—As this case and the next but one appear to illustrate the difference of action between the tincture and the powder of Colchicum, the notes made at the time shall be transcribed. It was quite evident that although the medicine in some degree mitigated the disorder, it produced it's unpleasant symptoms, and was therefore obliged to be discontinued before it had materially lessened the signs of inflammation.

*Case of Bronchitis in a Pregnant Lady treated by
Tincture of Colchicum.*

October 13, 1820.

Mrs. S., aged 35, applied, with all the symptoms of bronchitis. Her cough was exceedingly troublesome, and her breathing very difficult; she was in the seventh month of pregnancy.

Tinct. Colchic. ʒ ss.

Magn. Sulph. ʒ i

Pulv. Ipecac. gr. ss. and

Aquæ ʒ x

were given, four times in the day; and two grains of calomel, with five of Dover's powder, at bed-time, to still the cough, which was much complained of.

2d day. The symptoms were much the same; but the opium had produced much head-ache.

3d day. The symptoms of inflammation were very much reduced, she having been much purged; but exceedingly disagreeable symptoms of languor, sickness, and debility, were present; seven doses of the medicine having been taken. A volatile saline draught was given every five hours, but the sickness was not relieved until the next day, when she felt better in all respects, except that the cough was still troublesome. In the evening of this fourth day, the oppressed breathing was again present, and the cough was violent.

One Colchicum draught was ordered for bed-time, and an opening draught for the morning.

5th day. Not better. A Colchicum draught was now ordered, every night and morning.

46 CASE OF OPPRESSED POWERS FROM PLETHORA.

6th day. Somewhat better, but not materially. Continue.

7th day. She got up with the same symptoms of sickness, &c., which lasted all day, even though she had only taken three draughts within the last two days. She was now desired to take but one daily, and to continue it; but she refused to go on with them, and a grain and a half of Ipecac. was ordered four times a day instead. The Colchicum had purged her rather strongly every day.

October 24. The patient had taken one Colchicum draught daily, as desired, and had been purged; she was also somewhat better, but not much. Was desired to take the Ipecac. as directed. 26th. Was much better, and inclined greatly to prefer the new medicine. It was therefore directed to be continued.

October 16.

Mr. E., aged 23, complained of being so inclined to sleep, whenever he sat down, that he could not read for a quarter of an hour together. Twelve powders were given to him, with directions to take one, in half a pint of water, every morning early. 26th. The symptoms were reported to have subsided.

October 17.

Mr. W.'s servant, aged 20, was suffering much from inflammation of the bursa, which is above the cap of the knee. The constitution was materially affected by fever, and the part was very red. She had previously been bled by leeches, and had been purged. The tincture of *Colchicum* draught, as above prescribed in Mrs. S.'s case, was given ; she was desired to lie in bed, the leeches were re-applied, and low diet was enjoined. After taking six doses of the medicine, her knee was better, but she had, for some of the last hours, thrown up all her food with much of a very tenacious, slimy matter ; her pulse was quick, her tongue foul, her skin covered by an unpleasant perspiration, and she was altogether very uncomfortable.

These symptoms did not subside entirely, until after a lapse of three or four days.

On the 22d, she was permitted to get up, as her knee seemed to be well : but on the 25th, all her first symptoms had returned ; her knee was inflamed and very painful, and her constitution laboured under considerable fever. Five grains of calomel were given at bed-time, with seven of powdered *Colchicum*. 26th. The fever no longer existed, and the

redness of the knee was nearly gone ; so that no medicine was ordered.

Mrs. H.—This case is so remarkable, that it must be given in detail. It was the first in which I had dared to trust to an increased dose of Colchicum, instead of bleeding copiously, as the symptoms seemed to demand.

Case of Pneumonia cured by Colchicum.

Mrs. H., a laundress, aged 30, took cold on October the 1st, 1820 ; and it would appear, from her account, that her symptoms were those of pneumonia. She, however, continued her usual avocations as far as she was able ; and although her appetite did not allow her to take much food, she drank her usual quantity of porter every day. On the 17th day of her disease, I was called in, and found her labouring for breath, suffering much from cough, and distressed by symptoms of violent fever ; her pulse was 120, and hard, and her skin was very hot. Five grains of Colchicum powder, and a drachm of sulphat of potash, were ordered to be taken every six hours.

18th day. The symptoms were very little altered, and the medicine was continued.

19th day. There was, if any thing, an aggravation of symptoms; indeed her state was such, as to have peremptorily demanded the use of the lancet, under ordinary circumstances; especially, as the bowels had been copiously acted on by the seven doses, which the patient had taken. However, a pill, containing three grains of powdered Colchicum, was ordered to be taken three hours after each dose of the powders; when, on the 20th day, she felt much more comfortable in all respects, and on the 21st, every symptom was materially relieved. Her pulse was 100, and small; her breathing was 30 in the minute, that is, 18 less than on the 19th; her skin was cool; she had slept all night; and she felt almost well. During the last two days, the bowels had been very frequently and severely acted on; and, therefore, as she had, in that time, taken six doses of the pills, and as many of the powders, she was directed to take only two doses of each, during the next twenty-four hours; and not that, if the purging continued. It was very satisfactory to see, how much the complexion, the colour of the lips, and the general appearance of the patient, as to health, had improved during the last two days; indeed, a

medical friend who saw her on that day, because the amendment had been so remarkable, would scarcely believe that she had been so ill; indeed, he found her in the street. Smaller doses of Colchicum were ordered, and on October 26th, she was really well; her pulse being 76, although she had walked quickly down stairs, and she said her strength would permit her to walk to Town with ease, if it were necessary.

The remark will be excused, that the quantity of strength remaining to the patient after the subsidence of this severe affection, was very different, from what it would have been, if the cure had been performed by bleeding.

October 18th.

Mrs. W., aged 35. *Case of Phthisis.* At least, this lady had been for some time under the care of a physician, and latterly of two, with the additional attendance of the writer, for an affection of the chest, which was considered by all to be confirmed consumption. She had constant cough, and pain in her side; her fever bore the hectic character; she had most profuse morning perspirations, and her pulse was 120.

Her symptoms had been similar to the above,

for some time ; but, as an aggravation of them had been present for some days, it was determined, in consultation, that she should take Colchicum : and, therefore, five grains of the powder were given every six hours, in a saline draught, the tender state of her bowels precluding the exhibition of sulphat of potash.

After taking two doses, she slept better than she had done since the aggravation of her symptoms, and she felt better during the next day ; but after the sixth dose was taken, she was much purged, and felt very languid and ill.

The further exhibition of the medicine was of course stopped ; but on the succeeding day, she was materially better in all respects ; except, that the *quickness*, not the hardness, of the pulse still continued. The skin was cooler, and the fever much moderated ; the pulse was softer, and, what was the most indicative of a favorable change, the patient's sensations were much more like those of health.

A further continuance of the medicine was agreed on ; but as the patient was going, the next day, to Devonshire, for the benefit of the climate during the winter, it was recommended, that she should take the medicine

only twice in the day; and as intelligible directions as possible were given to her in writing, for her guidance.

Her favorable symptoms continued until she went away; or rather, they still further improved; for, a short time before her departure, even under the circumstances of hurry, her pulse had fallen to 108; and her husband said, that it had been under 100, at an early hour of the morning. The opportunity of further superintending the treatment of this case would have been very desirable.

Miss M., aged 25. *Case of Hysteria.* This patient, whose complaints had followed anxiety of mind, had been previously relieved by full purging; but as the paroxysms of lowness and agitation of the limbs still continued, with a foul tongue, and a somewhat hot skin, five grains of the powder were given with sal polychrest, four times in the day, with the object of getting it's purgative effect, as well as of moderating the irritable state of the heart's action. After six doses were taken, both these effects were produced; but the complaint was not alleviated; camphor and ammonia were then given, and this, followed by

a daily alterative and warm purgative, now produced the best effects, and the patient was soon well.

Mrs. R., aged 35, was suffering much from *lowness of spirits*, attended by a foul tongue, a hot skin, and much derangement of the digestive organs. The usual dose was given, twice a day, for four days, and the patient was very much relieved; especially, as soon as the bowels were freely moved. She then took one dose daily, for a week, and was quite well.

October 19th.

Mr. B., aged 70. *Case of sub-acute Rheumatism connected with a disordered state of the heart.* The commencement of this gentleman's case was very interesting. He had been for many years subject to severe attacks of pneumonia; but during the year 1818, he was frequently plagued by diarrhœa, and he seemed to be breaking up in his health. In 1819, however, he greatly recovered; his complexion was restored, he gained flesh, and felt quite well. In the autumn of the same year, a palpitation of the heart came on, with pulsation in the head; so that his physician, making use of a strong expression to shew the urgency of the

symptoms, said he must be cupped instantly ; hence, his pulse was then probably as hard and strong, as it was when the writer first saw him.

The patient then spent the Christmas holidays in the country, and was there bled, by means of leeches, for a similar affection. On coming to London, the writer saw him. At that time, his pulse intermitted ; but it was peculiarly full, hard, and bounding, and the beating in the head was very distressing, especially in the night. Leeches, cupping, purging, and low diet, did not relieve this state, the pathology of which was not clear ; when the pulse was found to be so strong one night, that a full bleeding was adopted. The present relief was perfect ; but almost immediately on lying down in bed, half an hour afterwards, syncope of an alarming character occurred, and continued for some hours.

This gentleman was seen afterwards by three several physicians ; cupping was repeatedly practised ; the heart was considered to be deranged in structure, but it was not determined in what way ; it was also suggested that an aneurism of the aorta might account for the beating in the head ; but, after a long and minute

attention had been paid to remedying the deranged state of the liver and digestive organs, the complaint gradually subsided ; so that, the patient went to the sea-side in May 1820, and continuing there till the autumn, he returned with his health in a great degree re-established; the beating in the head having nearly subsided. May the writer be excused for suggesting, that this affection was, perhaps, an inflammation of the internal membrane of the heart and arteries?

Previous, however, to his present application, he had experienced a gradually increasing pain in his shoulders and elbows, and had now much pain and soreness of the wrists and fingers ; the joints of which latter were swelled. With these symptoms, the actions of the system were not materially different from what they are in a state of health.

A pill, containing 3 grains of powdered Colchicum, was given every six hours. On the next day, the patient was better, and the medicine was repeated ; but after taking six doses, it became necessary to relinquish the use of the medicine, on account of the sedative action it had on the heart.

The pulse, from having been somewhat

hard, had become quite soft, and it beat only 32 times in a minute. The patient was unwilling to leave off the medicine, because he felt no ill effects from the diminished action of his heart, whilst his pains and uncomfortable sensations were greatly diminished.

He was more troubled by the beating in his head, and the pain in his arm, in the course of the succeeding night; and as his pulse had again risen to it's usual frequency, first, two, and then three pills were given in the 24 hours, with a sufficient dose of opening medicine in the morning.

On October 26th, he was much better, on the whole; but as he had still some pain at night, five grains of Dover's powder were given, and animal food was allowed. On October the 29th, he complained of being low and weak, which he thought was produced by the medicines acting two or three times on the bowels, every day. The opening draught was therefore omitted, and two ounces of decoction of bark were given twice a day.

Mr. A., aged 45. *Case of Aggravation of an habitual Asthmatic Cough.* His skin was

hot, and he felt a great constriction across his chest. After taking four doses, at intervals of six hours, he was violently purged and vomited; but on the next day, his chest, as he expressed it, seemed to be set at liberty, and the relief had continued up to October 28th, when he was last seen. He remarked, on the operation of the medicine, that he had never been so much relieved before by any other remedy.

October 20th.

Mr. F.'s child, aged 18 months. *Case of moderately severe Bronchitis.* Eight half-doses of the medicine, as usually prescribed, were given at intervals of six hours; and as there was great inflammation in the mouth, and swelling over one of the molares, the gum was freely lanced. Much relief followed this treatment; but it was discontinued, on account of the skin being quite cool; and rhubarb and magnesia, with a grain of Dover's powder, for the cough, were given three times in the day.

Mr. S.'s servant. *Case of Rheumatism.* This patient was the subject of the case, mentioned above, in page 24. She applied, on the pre-

sent occasion, on account of being somewhat feverish, and having pains similar to those which preceded her former illness. Nine doses of the medicine were given to her, with a direction to take one, three times a day. No report has been received of this case; but the writer is assured that she is well, or he should have heard from her.

October 21st.

Mrs. B.'s servant, aged 25. *Case of Quinsey.* She had been ill for three or four days; and now laboured under symptoms of considerable fever, with great difficulty of swallowing. Her tonsils were much enlarged, and were covered, in patches, by apparently a purulent secretion. She took eight doses of the Colchicum and sal polychrest; after which, purging was produced, and the inflammation of the tonsils, with the symptoms of general fever, had disappeared; but, as the glands continued to be enlarged and hard, an astringent gargle and small doses of opening medicine were ordered, and, in a few days, the patient was quite well.

Mr. B.'s servant, aged 16. This was a similar case to the last. The patient was going

into the country, and eight powders were given to him, with directions to take one, three times in the day : no report has been received of his progress.

Mr. G.'s servant. Four powders were here given, for a *whitlow* ; but as the abscess was freely opened, the writer does not lay much stress on them, as being the efficient means of relief.

October 22d.

Mrs. G., aged 60. *A case of severe Bronchial Inflammation.* The breathing was very difficult, and the lips and skin had a purplish hue. After taking four doses, in the common form, she was relieved ; but, as she was also much purged, a pill was given every four hours, consisting of three grains of the powder only. On the 6th day, she was nearly well ; but, as she felt low, and the signs of increased action had entirely disappeared, the Colchicum was discontinued, and rhubarb, with camphor and a little opium, was prescribed with success.

Miss G.'s servant, aged 60. This was a very satisfactory case of *great pain, swelling, and inflammation of the leg* ; produced by an ex-

cited and inflamed state of the constitution, acting on varicose veins of the leg. The patient's skin was very hot, and her pulse peculiarly hard. Colchicum was prescribed.

On the next day, her feelings were much more comfortable ; and on the 3d, all signs of inflammation had disappeared, and the swelling was gone.

A laced stocking was ordered ; and very little further care was required.

Mr. P., a baker, aged 30, applied for a *swelled face*, produced by the irritation of a portion of decayed tooth acting on the gum, in consequence of the habit being predisposed to fever. The piece was removed ; but his tongue was much furred ; and, in the evening, he had a severe attack of fever. Calomel and purging medicine were given ; but, as he was very little better on the succeeding day, the Colchicum was ordered. On the day but one after, he was met, wheeling his barrow along the street, and had discontinued his medicine after the fourth dose. He was quite well on the sixth day.

Miss R., aged 15, took four doses, in two

days, for a smart attack of *common fever*, from a cold, as she said; and with such perfect relief, that, she only took a small dose of opening medicine, daily, for three days afterwards.

October 24th.

Master. G., aged 8, applied with symptoms of *common fever*, similar to those of the last case. After taking seven three-grain doses, he was found to be exceedingly languid and weak, with his skin pale, and his spirits much depressed. The medicine had acted copiously on the bowels, but had not made him sick. His tongue was covered by a thickish grey slimy fur, as if from irritation; but his feverish symptoms were entirely gone. The mineral acids were given, and a more generous diet allowed, and on October 28, he had nearly regained his usual health. Two doses less of the medicine would have been better in this case.

October 25th.

Miss B., aged 14, resided at the same school with Miss R., and laboured under exactly the same symptoms of *common fever* as Miss R. did. She took six doses, and required no further medicine.

62 CASES OF BOILS AND TUBERCULAR ERUPTION, WITH
FEVER, CURED.

October 26th.

Miss A., aged 9, had been much troubled by *boils*, attended by some symptoms of *fever*. Four-grain doses were given twice a day; and, on the third day, it was found necessary to exhibit the medicine only once a day.

Master C., aged 6. *Case of tubercular eruption on the arms, attended by fever.* This little boy lay in bed, with a very hot skin and heavy eye; and the pupils much dilated; a large head, and a disposition to scratch the head; a lethargic kind of sleep constantly on him, and his arm covered by large, hard, raised, and red swellings of the skin, which were very tender to the touch. Four half-doses were followed, on the next day, by some purging, and an evident reduction of the inflammatory symptoms, as well as of the size of the pupils. He had slept also, more naturally; the soreness of the humours was much less, and the parents had lost their fear of impending hydrocephalus; of which disease they had had others of their children die.

The boy took four more powders, before the third day; when, the symptoms were nearly

gone. The medicine was now discontinued, on account of the languor which seemed to be on the eve of coming on. Fourth day; the patient was really well. Even the remains of the swelling were no longer to be seen, the boy was lively, and his tongue was quite clean.

Mrs. W., aged 55. Had formerly had a very large *ulcer of the leg*, which had left behind it a hardened, smooth, and tight band of skin, which surrounded the middle of the leg, putting on an appearance, as if the size of the leg had been diminished in that part, by the constant application of a roller.

A week before she applied, symptoms of fever had occurred, and the leg had swelled and become very painful; and, two days before, an ulcer had formed, and had continued to enlarge.

On examination, her state was as follows:—The leg was swelled, and very painful; the contracted band of skin, and a portion above, as well as below it, was of a purplish lead-colour; which dark coloured parts terminated in skin of a deep red-colour; patches and broad irregular lines of the same red-colour extending over other parts of the leg, and appear-

ing, as if they took the course of absorbents. In the centre of the dark coloured, contracted portion, a perfectly circular ulcer, as large as a crown-piece, was seen, and a smaller one appeared below. The colour of the granulations of both these ulcers, was of the same purplish tint. In short, the whole leg appeared, as if mortification would take place.

The patient's skin was very hot, and her pulse was exceedingly hard and strong; her tongue was dry and foul, and her general appearance that of one labouring under severe fever; indeed, she stated, that she had not slept for a night or two, on account of the painful state of the leg, and the symptoms of general fever.

The medicine was given six times, in the 24 hours; and, as she took two doses before going to bed, it was apparently sufficient to give her a tolerably good night; whilst, on the next day, after six doses had been taken, she felt quite easy, and, as she said, almost well, in comparison to her state on the preceding day; and this, although the medicine had not had any perceptible action; for the bowels had not been opened, and none of the other secretions had been increased.

Before taking the seventh dose, however, severe purging, for several hours, took place; and, on the third day, she said she was, as she really almost was, quite well; at least her leg had acquired its natural colour, and the swelling was so completely gone, that the patient refused, at first, to show her leg, because it would give her the trouble to take off the bandage which secured some wet cloths by which it was surrounded, and because, as she said, the ancle-bone could be felt through the stocking, as well as ever.

Of course the medicine was not continued, after the seventh dose.

It was curious to remark the altered appearance of the ulcers. The dark colour had almost entirely left them; and the granulations were gradually acquiring a rosy tint.

This patient's tongue, however, was not clean; therefore she was desired to take a little common opening medicine daily; and to be cautious in increasing the stimulating quality of her diet.

That this case may produce the proper effect, it may be stated, that, the patient's situation was such, as to have convicted the practitioner of deplorable ignorance, if he had not taken

away blood; unless, as in the present instance, he believed that he possessed a better remedy than the lancet.

The writer has only to add to this account of cases, that, in the period which he marked out above, his own three children, aged three years and a half, two years, and one year, were, in succession, treated by *Colchicum* for colds attended by the preliminary symptoms of severe tracheal or laryngeal inflammation. An emetic was premised, with great advantage, in each case, and two grains and a half of *Colchicum*, with half a drachm of sulphat of potash, were given four times a day for two days; when the medicine was no longer required, except that in the second child, it was unfortunately continued for three days, and therefore occasioned considerable languor and sickness, with a dirty greyish fur on the tongue.

In the youngest child's case, the *Colchicum* appeared to do for her what other modes of treatment had failed to perform.

When three months old, she took cold, by going out in the winter weather; and was affected by so severe an attack of *bronchitis*, that her life was only preserved, under the very skilful management of Dr. Armstrong and

Mr. Alcock, by bleeding, emetics, sinapisms, ipecacuanha in nauseating doses, the warm bath, and keeping her skin constantly covered by thick flannels, so as to prevent the possibility of the warmth of the surface being improperly dissipated.

The complaint did not entirely recede ; and, a chronic state of noisy breathing remained, with a convulsive cough, occurring in spasmodic paroxysms, which produced a suffusion of the countenance, and a distress which was often of a very alarming nature.

No plan of treatment relieved this state, as very little increased action of the system remained ; indeed, all modes of depletion, blisters not excepted, appeared to aggravate the complaint ; when, bark and hemlock were given, with very marked and permanent relief ; but, as the breathing was still so husky, that she could be heard across the room, and as the paroxysms of coughing occasionally happened, though in a less degree of violence, she was carried in June to the sea-side ; in the hope, that attention to her general health would save her from the gradual formation of a disorganized state of the lungs, or prevent a foundation being laid for future asthma.

Whilst at the sea-side, the child got into excellent health; and returned, at the end of a month, quite fat, and nearly free from her respiratory symptoms; but the latter soon returned in a rather more considerable degree, although her health did not decline.

These symptoms gradually got less, however; so that, by September, little or none of the rattling breathing or cough remained. They returned for a few days, on the child's cutting a tooth; but, about the 20th of October she caught cold; and, as another tooth was also pressing on the gum, all the symptoms returned with almost, apparently, their former violence. She was now treated by Colchicum, as above mentioned; and, on the third day, she had entirely lost all her complaints; so that she was quite as well as before the last attack.

After having thus given so many cases in detail; and indulged, for the sake of offering an unexceptionable account of my practice, in an account of so many, perhaps uninteresting cases, treated in succession by Colchicum, it would perhaps be more respectful to leave them for the consideration of the profession, without comment; but, whilst the last series of cases contains several of the most interesting

examples of the beneficial action of Colchicum, it may be remarked, that it shews the variety of cases to which the medicine is applicable, and something too, of the peculiarity of action of the tincture, which has led to the preference which is here given to the powder. The cases also illustrate, in some degree, the unfavorable operation of the medicine when it is pushed too far. But, as some observations will be made below, on each of these heads, except the first, it will be sufficient here to point to the case of sore nipples, as to one, which leads to a new hope of occasionally curing an untractable disease; to that of threatened consumption, and that of actual Phthisis, as being interesting in many points of view; to the two of inflamed leg, as fully illustrating the great powers of Colchicum, in remedying states of vehement local excitement; to that of tubercular cutaneous disease, as proving it's efficacy in the treatment of skin disorders, when joined with an excited state of the constitution; and lastly, particularly to the case of severe pneumonia, as a proof, that the Colchicum may be occasionally trusted to for the cure of such very violent states of inflammatory disease, as have hitherto been cured by the lancet, and perhaps by the lancet only.

It only remains now, before bringing this pamphlet to a close, to make a few observations on the writer's views in employing the *Colchicum autumnale* as a medicine, on it's mode of action, the precautions necessary for it's due exhibition, the proper mode of preparing the remedy, and on some other circumstances connected with it's employment as a medicine.

Accustomed, as the writer has long been, to consider the generality of complaints as the offspring of an undue excitement of the constitution, from irritations, applied either from without, through the medium of the atmosphere or other accidental agents, or from within, by local derangements of action or of structure, his employment of *Colchicum* has been, and is likely to be very extensive; for, as it has appeared to controul arterial action more certainly than any other individual agent except bleeding, and more safely than even the lancet, it generally forms a part of his early treatment of all diseases that are accompanied or caused by increased action of the heart and arteries.

It is necessary, however, to say, that, with all his confidence in it's powers, he has not,

hitherto, except in one case, trusted to it alone in very violent states of disease ; such as what is called idiopathic fever in it's worst forms, puerperal fever, when it threatens the immediate destruction of life, and such acute inflammations as we are accustomed to subdue only by the most copious depletion, &c. This has been so, 1st, because, consistently with his present experience, it is probable, that, even under the most skilful management and boldest mode of exhibition, it would not supersede the lancet in all such cases ; and 2dly, because, it is only a very extensive knowledge of any medicine, which will authorize a practitioner to employ it, in preference to old established modes of practice, in cases of great or immediate danger. But, from the successful result of the case above alluded to, (page 48,) we may hope that even in very many of these cases, further experience will show, that the Colchicum may be confided in, and that it will prove to be, in all, an eminent auxiliary to bleeding ; and that thus, by materially lessening the quantity of blood necessary to be drawn, it will be the means of saving many lives, which, under a more copious use of the lancet, would be lost ; as much

perhaps from the injurious effect of the remedy, as from the violence of the disease.

It is hoped that these anticipations will not be considered to be too strong; indeed, the writer feels that they are more than fully authorized, or rather, that they have been verified in his own practice; but he is anxious to state less rather than more, as what he thinks he knows on the subject, for fear it might lead such practitioners as have not been drilled to the use of Colchicum equally with himself, to trust to it in important diseases, before they have verified it's beneficial operation in less severe cases.

Hitherto, however, the remedy has been, on the whole, less successful in the writer's hands than those of his father. This has arisen, partly from his father having used it longer, and understanding it better; and partly, perhaps, because the writer's mode of exhibition has been, until lately, somewhat peculiar; inasmuch as he gave more opening medicine with it, and therefore trusted less to the specific operation of the Colchicum, and more to the common purgative, than his father has done.

The ordinary form of prescription is a powder, composed of one part of powdered

Colchicum, three of carbonate of potash, and five of sulphat of potash. Of this powder, one drachm is directed to be taken, three or four times a day, with half a pint of warm water, in the state of effervescence, with tartaric or citric acid. To this, is sometimes added a dose of calomel at night; and, where the bowels are not freely moved before the second or third day, and the disease is violent, salts and senna, to quicken it's operation; but in very violent cases more Colchicum is required, whilst no more purgative medicine can be borne; and then, as in the case detailed in page 48, pills of Colchicum only, are given between the doses of the powders. Or, in other cases of violence, pills of calomel, and of from five to eight or ten grains of Colchicum, are given in the first instance, to be followed by the powders, as directed above.

In cases where bleeding is considered to be advisable, it is made to precede the exhibition of the Colchicum.

It will usually happen that the medicine will produce some relief on the second day; but not it's decidedly beneficial operation till the third day, when purging generally takes place.

In some cases, indeed, no relief occurs, even on the third day, when full doses of opening

medicine are required, or it is necessary to increase the dose of *Colchicum*: but in others, the medicine purges on the second day, without producing a corresponding relief of the symptoms; or, the case is such, as to make much purging unadvisable: in these cases, a smaller quantity of the *sal polychrest* is given with the *Colchicum*, or the latter alone, without admixture.

In whichever of these ways the full operation of the medicine may be produced in the treatment of acute diseases, it is to be then discontinued; entirely, when the relief is perfect, or the actions of the constitution are subdued to the standard of health; or the medicine is given in less powerful doses, where any remains of excitement exist.

In chronic complaints, a small dose of *calomel*, or blue pill, and of *aloes*, with two or three grains of *ippecacuanha*, is usually given at bed-time, every night, and one or two of the drachm powders in the day.

In children and weakly subjects, the dose of the powder, in all cases, varies from sixteen grains to two scruples; so as to give from two to five or six grains of the *Colchicum*, the full drachm containing about seven grains.

It is necessary, however, to be cautious in taking these doses of the powder, as a general rule. As little even, as three grains every six hours, will be sufficient to overcome common feverish attacks, especially in persons of but moderate powers; at least, if the powder be good: but also, because Mr. Thomson has made it very probable, in a paper published in the London Medical and Physical Journal for October, and in the Medical Repository for the same month, that different specimens vary much in their strength, according as they are gathered at different times of the year, and are dried with more or less care.

Mr. Thomson thinks he has proved, that the bulb is in it's highest state of excellence in the month of July, or at the latest, early in August; and also, that drying the bulbs at a higher temperature than that of the atmosphere, materially tends to dissipate the apparently evanescent principle, on which their efficacy depends. Mr. Battley, however, has published an answer to Mr. T's. paper, in the Medical Repository for November; in which he advocates the advantage of drying the bulbs, after being sliced immediately on being ga-

thered, at a temperature of 170° of Fahrenheit.

Both these accounts cannot be right : indeed the subject is still entirely *sub judice* ; for some authors have said, that the bulb is most active when gathered in the spring, and even that it possesses no medical properties if permitted to grow till the Autumn. Under these circumstances, the writer has only to say, that neither his father nor himself has found the different specimens which they have used, to vary very materially from each other in practice, although they have been gathered both in Spring and in Autumn, or have been purchased from different druggists ; but then they have invariably powdered the dried bulbs at home, except in the case of the powder used at the Chelsea and Brompton Dispensary ; which, although it was procured at Apothecaries' Hall, was decidedly inferior, in point of efficacy, to the rest.

The writer has, however, still further to remark, that the powder he is at present using, is more powerful than he has before used, and that it was gathered in the meadows, near Derby, about the middle of September, when

the plants were in flower, and was dried at, at least, 130° of temperature, on the day it was gathered; having been first cut into thin slices and spread out on perforated trays. It was powdered on the day after; and the writer will be excused for taking this opportunity of thanking his friend Mr. J. H. Bainbrigge, House-surgeon to the Derbyshire General Hospital, for having been at much pains to supply both the writer and his father, as well as the Hospital, with a large quantity of dried bulbs and powder, prepared as above described.

The result of one of Mr. Bainbrigge's operations was, that from eight pounds of the fresh bulbs, 2lbs. 15oz. of dried slices were obtained; and from them 2lbs. $10\frac{1}{4}$ oz. of fine powder, with 4oz. of hard, brown, outside scales, which latter were very difficult to powder, and were not used.

The writer has but little to offer respecting the use of the tincture of Colchicum as a medicine, because he has not used it extensively; but that little is decidedly in opposition to it's being at all to be compared with the powder, as to it's utility. Indeed he scarcely recollects a case in which it did not produce unpleasant effects; and therefore, as these effects often

78 COMPARISON OF THE TINCTURE WITH THE POWDER.

happen before the disease is materially relieved, and as he can place such perfect reliance on the powder, he will continue to use and recommend it exclusively, until some more industrious observer shall show how the tincture may be used more advantageously.*

The experience of Dr. Williams, of Ipswich, of the efficacy of the tincture, made from the seeds, is much more satisfactory, and merits every attention. It is to be hoped that Dr. Williams will extend it's use to the treatment

** The following extract from a letter is gladly inserted here, as it bears directly on this point, and contains much useful information.*

“ November 3, 1820.

“ Since I left London, I have had numerous opportunities of witnessing the *almost* specific powers of the Colchicum in gout and rheumatism, acute and chronic; and as you were, when I attended the Hospital, using it, it may not be uninteresting if I mention the mode in which I have found it produce it's beneficial effects. I give ʒij of the tincture, with thirty drops of laudanum, at bed-time, in a little cold water; and if the pain be very violent, or not much relieved, repeat the dose in the morning; but if it be abated, which it usually is, then nothing is required till night, when the same dose is taken. After the second dose, ʒi, with gr. v. of the pulvis cretæ comp. night and morning, finishes the cure. I find it necessary to give laudanum with the ʒij, or it would act very violently on the bowels; so much so, in some cases, as to preclude it's exhibition. The pulvis cretæ comp. is given with the same intention in the lesser dose, and is quite sufficient.”

of acute as well as chronic diseases, and will favour the profession with the result of his investigations.

With regard to the powder producing, like the tincture, any unpleasant or dangerous effects on the constitution, this so seldom happens, that the writer's father says his horse's case was the first, in which any thing more than languor and sickness has been produced. The writer has, however, seen these symptoms go on almost to fainting; and, in one old man, who died of apoplexy, his jealousy of a new mode of cure made him somewhat apprehensive, that this languor might have added to his danger; but it did not appear to be so, to another practitioner who saw the patient. In one old lady, who was cured of pneumonia by Colchicum, and whose daughter, it was said, had died after taking an over dose of the tincture in gout, the appearance of the patient was very remarkable. She lay in bed, perfectly free from all inflammatory complaint, and, indeed, with every appearance of the *calmest* state of health; except, that her countenance was anxious, and her feelings were exceedingly uncomfortable to herself. She complained much of languor, of a sense of sick-

80 CASE OF GREAT EXHAUSTION, FROM AN OVER-
DOSE OF THE POWDER.

ness, and of a most debilitated state of the whole system. The whole had disappeared on the next day. This was by far the worst case of the kind that the writer has seen;* in several others, however, sickness and purging have

* He had hoped to have possessed himself of the particulars of a case of bronchitis, which occurred to one of his friends, a fortnight ago, and in which, the patient was brought into great hazard, by the violence of the purging produced by the powder. The patient, however, was a weakly female, who had been made to faint, from the loss of very small quantities of blood, three times, within the few preceding days, for a severe attack of bronchitis. It seems that she took five grains of the powder every four hours, with half a drachm of sal polychrest, for twelve times, when the purging became incessant, and the patient's slender powers were nearly exhausted.

The writer is sorry that he is not further acquainted with the particulars of the case; but he believes, that the quantity of sal polychrest was lessened after the first few doses, on account of the purging which was produced, and therefore, probably the use of the remedy was continued much longer than was proper.

In this case, the writer believes that the tongue became at last quite dry and dark coloured, as in typhus; but usually, where the Colchicum is pushed too far, the fur on the tongue is of a greyish colour, and lies on the part like a thick coat of slime.

Did the tendency which exists, for inflammation of the mucous membrane lining the bronchia to lapse into a similar inflammation of the mucous membrane lining the bowels, increase the irritation in the above case? at least, it should warn us to be more careful, not to push the remedy so far in mucous diseases, as in inflammations of a different order of parts.

warned him to omit the medicine; but then, the leading symptoms of the disease have been generally, by that time, removed; which cannot be said in all cases where sickness, &c. follows the use of the tincture.

Another point, also, in the management of *Colchicum*, requires attention. Just, as neither bleeding nor purging will remove inflammatory complaints, if attention be not paid to the diet, to the state of the skin, and to the usual collateral requisites of a successful medical treatment of disease; so, the same attention is necessary during the exhibition of *Colchicum*: and it is the more useful to press this point, because, it frequently happens, that, a good remedy is brought into disrepute by a supposed failure, when the failure has arisen from inattention to such collateral circumstances as are alluded to above.

The writer can offer but little information on the mode in which *Colchicum* acts. Indeed, we know but little of the mode of action of any medicine. *Rhubarb* purges, but we do not know why; *opium* lulls pain, but we deceive ourselves if we suppose any explanation is given of the fact, by saying, that it acts on the nervous system; because the question recurs, how does it act?

The sensible effects of Colchicum would appear to be, to controul the action of the heart and arteries, and, indeed, often to reduce that action below that of the standard of health. This effect is frequently produced long before it's other sensible effects are apparent: but when continued long enough, and generally before it's remedial virtues are decidedly obtained, purging takes place. Sickness and sometimes vomiting accompany the purging, in some instances; whilst, in others, the secretion from the kidneys, or from the skin, is increased, sometimes even without the former symptoms being perceived. In short, the custom of pharmaceutical nomenclature may perhaps authorize us in calling it a sedative; with this distinctive peculiarity, that it acts with energy in increasing the secretions, when given in sufficient quantities.

One subject still remains to be noticed, before concluding this essay. The Colchicum autumnale is a very powerful remedy, and is therefore either for good or for evil. It is not a medicine to be played with, nor a weapon to be wielded by unskilful hands, without danger. Like the lancet, if used improperly or pushed too far, it will bring with it regret and disappointment; but, like the lancet, it is hoped

it will amply repay him who uses it skilfully, and with due caution and moderation.

It may be said that, if we think about it, these observations are unnecessary; because they must apply to all remedies of great power: but they had better be repeated twenty times, than be forgotten once; and therefore the writer begs that his readers will take nothing that is here written, on trust; but that they will look on these observations as mere hints, which may guide them in their own cautious investigation of the subject, and then he ventures to say, that neither he nor they will be disappointed.

It is apparent, that this is a very imperfect account of the medicinal effects of the *Colchicum autumnale*. It fails in discriminating accurately, the forms of acute disease, in which the remedy acts most efficaciously; it does not point out those, in which it is useless; it refers almost entirely to the use of the remedy when given only in one state, and in one combination; and therefore the advantages, which may doubtless be derived in many forms of complaint, by giving it in conjunction with other kinds of medicine, are scarcely hinted at. But the writer proposed to give only the

results of his father's and his own experience, and he hopes, that enough has been said to show, that, with due care in the preparation and exhibition, the *Colchicum autumnale* is a most useful means of meeting increased action, and that it forms an important addition to the catalogue of our pharmaceutical remedies.

FINIS.









